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THESIS

LESSONS LEARNED FROM AN AFLOAT INSTALLATION OF AN ASHORE COMMAND AND CONTROL SYSTEM

by

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September 2005

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13. ABSTRACT (maximum 200 words)

The installation process for afloat systems is very stringent. This rigor is necessary to ensure the Warfighters can fully utilize the functionality provided by information technology (IT) aboard a ship, especially when underway – removed from most technical support and assistance. However, this rigor also increases the difficulty of executing an afloat installation. The purpose of this thesis is to document the lessons learned from the installation of the Ocean Surveillance Information System (OSIS) Evolutionary Development (OED) on board the USS Blue Ridge (LCC-19). OED is an ashore multi-level secure (MLS) command and control and intelligence (C2I) computer system that is fielded at the Joint Intelligence Centers and Joint Analysis Centers. The MLS aspect of OED allows the operator to view and add value to data from multiple security domains on one workstation. In the space, weight, and power (SWAP) constrained environment of a ship, this technology is very advantageous. Since OED is an ashore system, this afloat installation presented a number of challenges and a unique perspective into the installation process. This thesis documents these challenges, how they were overcome and provides future installers recommendations to improve the planning of future afloat installations.

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ABSTRACT

The installation process for afloat systems is very stringent. This rigor is necessary to ensure the Warfighters can fully utilize the functionality provided by information technology (IT) aboard a ship, especially when underway – removed from most technical support and assistance. However, this rigor also increases the difficulty of executing an afloat installation. The purpose of this thesis is to document the lessons learned from the installation of the Ocean Surveillance Information System (OSIS) Evolutionary Development (OED) on board the USS Blue Ridge (LCC-19). OED is an ashore multi-level secure (MLS) command and control and intelligence (C2I) computer system that is fielded at the Joint Intelligence Centers and Joint Analysis Centers. The MLS aspect of OED allows the operator to view and add value to data from multiple security domains on one workstation. In the space, weight, and power (SWAP) constrained environment of a ship, this technology is very advantageous. Since OED is an ashore system, this afloat installation presented a number of challenges and a unique perspective into the installation process. This thesis documents these challenges, how they were overcome and provides future installers recommendations to improve the planning of future afloat installations.

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LIST OF ACRONYMS

AIT - Alteration Installation Team
AOR – Area of Responsibility
API – Application Program Interfaces
AUTODIN - Automated Digital Network
BFI - Battle Force Interoperability
BG - Battle Group
C2 - Command and Control
C2I - Command and Control and Intelligence
C4ISR - Command, Control, Communications, Computers and Intelligence/Surveillance and Reconnaissance
C7F - Commander Seventh Fleet
CAC - Common Access Card
CCB - Change Control Board
CCG 7 - Command, Carrier Group Seven
CDS - Cross Domain Solution
CINC - Commander in Chief
CIP - Common Intelligence Picture
CNO - Chief of Naval Operations
COE - Common Operating Environment
COP - Common Operation Picture
COTS - Commercial Off-The-Shelf
COWAN A, C, J, K - Coalition Operational Wide Area Network Allied, Coalition, Japan, Korea
DII - Defense Information Infrastructure
DISA – Defense Information Systems Agency
DoD - Department of Defense (US government)
EMC - Electromagnetic Compatibility
EMI - Electromagnetic Interference
EMP - Electromagnetic Pulse
ESD - Electrostatic Discharge
FBI - Federal Bureau of Investigation (US government)
FLTCINC - Fleet Commander in Chief
FLTCOM - Fleet Commander
FMP - Fleet Modernization Program
FPOP - Forward Point of Presence
GENSER – General Service
GCCS-I^3 - Global Command and Control Systems-Integrated Imagery and Intelligence
GCCS-M - Global Command and Control System - Maritime
GOTS - Government Off-The-Shelf

GWOT - Global War on Terror
HPUX - Hewlett Packard UNIX
HVAC - Heating, Ventilation and Air Conditioning
I&W - Indications and Warning
IA - Installation Activity
ICD - Installation Control Drawing
ILS - Integrated Logistics Support
IMO - Installation Management Office
IT - Information Technology
ITS - Imagery Transformation Services
JAC - Joint Analysis Center
JC2 - Joint Command and Control System
JCDX - Joint Cross Domain Exchange
JIC - Joint Intelligence Center
JTA - Joint Technical Architecture
JTF - Joint Task Force
JWICS - Joint Worldwide Intelligence Communications System
MIDB - Modernized Integrated Database
MLS - Multi-Level Secure
MLTC - Multi-Level Thin Client
MSL - Multiple Single Levels
NAVSEA - Naval Sea Systems Command
NDE-NM - Navy Data Environment - Navy Modernization
NSV - Noise, Shock and Vibration
OED - Ocean Surveillance Information System (OSIS) Evolutionary Development
OOB - Order of Battle
OPNAV - Office of the Chief of Naval Operations
OSIS - Ocean Surveillance Information System
OTCIXS - Officer in Tactical Command Information Exchange Subsystem
OTH - Over The Horizon
PEO - Program Executive Office
PC – Personal Computer
PMW - Program Manager, Warfare (SPAWAR)
POA&M - Plan of Action and Milestones
PY - Planning Yard
RADHAZ - Radiation Hazard
RCS - Radar Cross Section
RDT&E - Research Development, Test and Evaluation
RMMCO - Regional Maintenance and Modernization Control Office
SAP – Special Access Program
SAR - Ship Alteration Record
SATCOM - Satellite Communications
SCAMP - Speed to Capability Approval, Management, & Planning Process

SCI - Specialized Compartmented Information
SHIPALT - Ship Alteration
SID - Ship Installation Drawing
SIGSEC - Signal Security
SIPRNET - Secret Internet Protocol Router Network
SOVT - Ship Operational Verification Test
SPAWAR - Space and Naval Warfare Command
SPAWARSYSCEN - SPAWAR Systems Center
SPECAT - Special Category
SPIDER - SPAWAR Integrated Data Environment Repository
SPM - Ship Program Manager
SUBSAFE - Submarine Safety Certification Program
SWAP - Space, Weight and Power
TCCP - Temporary Configuration Change Proposal
TDBM - Track Database Manager
TEMPALT - Temporary Alteration
TEMPEST - Test for Electromagnetic Propagation and Evaluation for Secure Transmissions
TJCF - Temporary Justification Cost Form
TMS - Track Management System
TRE - Tactical Receive Equipment
TYCOM - TYPE Commander
US - United States

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EXECUTIVE SUMMARY

The afloat installation approval process is a very stringent and rigorous set of NAVSEA processes and policies. In the summer of 2003, an ashore C4I system, the Ocean Surveillance Information System (OSIS) Evolutionary Development (OED), was installed on board the USS Blue Ridge (LCC-19). This was the first complete installation of OED on board a ship and the first time the OED team addressed the requirements of an afloat installation. Therefore, the OED installation aboard LCC-19 provided a unique case study of the afloat installation development and approval process.

This thesis documents the installation of OED on board the USS Blue Ridge including the background behind the installation, the challenges and issues faced by the installation team, how those challenges and issues were overcome, and lessons learned for future installations. This thesis provides future installers with recommendations to plan and complete future afloat installations better.

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I. INTRODUCTION

A. BACKGROUND

Command and Control (C2) is a critical piece of any mission conducted by our Warfighters. One very important aspect of C2 is intelligence (I) (Edwards, 1990). Intelligence allows the Warfighter to assess the battlefield, courses of action, and probable outcomes. One of the tools the Warfighter uses to help him carry out C2I situational awareness is the Ocean Surveillance Information System (OSIS) Evolutionary Development (OED) (COMSECONDFLT, 220115Z NOV 03). Please note version 5.0 of OED will be the first version of the OED follow-on system, Joint Cross Domain Exchange (JCDX. JCDX employs web services to provide C2I services to United States and coalition partners across a wide array of security domains. OED is a suite of applications, graphical tools, and data that allows the Warfighters from different Services and other countries to work together to perform C2I functions. OED is built upon a common foundation of services and functions called the Common Operating Environment (COE). The COE was developed to promote interoperability and reuse of common components of any C2I system (Rodriguez, 2004).

Today's Global War on Terror (GWOT) is a Coalition war (COMSECONDFLT/COMTHIRDFLT, 211942Z FEB 03). The question facing our Warfighters is, "How do we share our C2I products with our allies and still protect the security and sensitivity of that data?" Back in the mid-1990's, a project was started to answer that question on a COE-based system. That project was OED and the engineering approach utilized to provide security was Multi-Level Security (MLS).

MLS technology allows the Warfighter to address the numerous security domains inherent in today's military environment. These domains range from the common security enclaves of TOP SECRET, SECRET, CONFIDENTIAL, and UNCLASSIFIED to the more cumbersome domains of Specialized Compartmented Information (SCI), Special Category (SPECAT), Special Access Programs (SAP), and those are just US

security domains. Coalition networks and communication lines are now a necessary piece of this security puzzle.

Although the ability to securely and safely share C2I information is the driving force behind an MLS-capable C2I system, there are other benefits. It is not uncommon for the Warfighter to have numerous monitors on his desk in order to assess the data found in each of these domains. However, this approach is flawed due to the size, weight, and power (SWAP) limitations found aboard a ship and due to the inefficiencies and inaccuracies involved in the Warfighter conducting correlation of data in his head vice using correlation algorithms to perform that very tedious and convoluted task. MLS technology addresses these issues by tagging all the data with their corresponding security labels. Thus, all the data can now reside in one database so the correlation algorithms can process the data thoroughly and the Warfighter can see all the data that he is authorized to see based on his clearances, need-to-know, and physical location. MLS is an incredible means to utilize the entire set of data, thus providing value-added to all the participants in the database, and still ensure the data is protected so no one can see data that they are not authorized to access (Miller, 2003).

Due to the nature of naval warfare, systems on board ships must meet stringent requirements and the installation of afloat systems must follow established processes. These processes provide step-by-step guidance in some aspects and broad areas left to interpretation in other areas. These processes are often circumvented or performed piecemeal based on each specific installation. It is very rare the entire process is followed in an installation. Since OED is an ashore system, the first afloat installation of OED on board the USS Blue Ridge (LCC-19) provided a unique opportunity to gather lessons learned and apply them to best practices. This thesis will greatly benefit future installations.

B. PURPOSE

The purpose of this thesis is to document the lessons learned from the installation of the OED on board the USS Blue Ridge. OED is an ashore MLS C2I computer system that is fielded at the Joint Intelligence Centers and Joint Analysis Centers. The MLS

aspect of OED allows the operator to view and add value to data from multiple security domains on one workstation. Since the on board environment of a ship is very constrained by SWAP considerations, this technology is very advantageous. As with any afloat installation, there were problems and issues to work out in order to complete the installation. However, the OED installation aboard LCC-19 provided a unique case study of the afloat installation process because the USS Blue Ridge installation was the first complete afloat installation for OED. This thesis documents these challenges and issues, how they were overcome and provides future installers recommendations to improve the planning of future afloat installations.

C. RESEARCH QUESTIONS

The following research questions are addressed:

1. What is OED and why should it be installed afloat?
2. What is the installation process and what are the various documents, diagrams, lists, plans, etc. required for a robust shipboard system design and installation?
3. What are the approval/authorization/certifications required for an afloat installation?
4. Which organizations are involved in the installation process and what roles do they play?
5. What are the risks and challenges associated with an afloat installation?
6. What lessons were learned from this afloat installation that can benefit future installations?

D. BENEFIT OF THE STUDY

This study develops lessons learned and identifies best practices for afloat installations. Although every afloat installation is unique, the installation policies and procedures attempt to provide the installer with a common baseline for every installation. The lessons learned and best practices discovered in this installation and documented in

this thesis will strengthen the foundation policies and processes and help installers work through unique issues that will inevitably arise.

E. SCOPE

This thesis explores the installation of OED on board the USS Blue Ridge to include an analysis of the installation process; the products of this process; and the lessons learned during the installation.

F. METHODOLOGY

1. Fully document the genesis of the OED afloat requirement.
2. Conduct a thorough review of the installation process, the parties involved, and the requirements mandated by the process.
3. Interview the parties involved in the OED installation.
4. Review the documents, diagrams, charts, etc. utilized in the OED installation on board LCC-19.
5. Review the issues and obstacles encountered during the installation.
6. Identify lessons learned and best practices for all future installations based on the lessons learned from the OED installation aboard LCC-19.

G. ORGANIZATION OF THE STUDY

This thesis is organized in a fashion to familiarize the reader with the whole installation process. The process starts with a Warfighter requirement and an analysis of possible solutions to answer this requirement in Chapter II. Once the engineering solution has been identified, the solution has to be implemented or, in this case, installed on board a ship. The installation of a system on board a ship requires stringent processes and procedures to ensure the initial requirement is met without diminishing the existing infrastructure, applications, systems, security boundaries, etc. The installation process and how it applies to a new afloat installation is the subject of Chapters III and IV. Because of the uniqueness of the OED installation afloat, the lessons learned from this installation are very valuable and Chapter V identifies those lessons learned and how to

apply them to future installations. Chapter VI provides a conclusion with recommendations for further study.

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II. OED AND INSTALLATION PROCESS REVIEWS

A. OCEAN SURVEILLANCE INFORMATION SYSTEM (OSIS) EVOLUTIONARY DEVELOPMENT (OED)

In order to better understand OED and the unique capabilities it provides the Warfighter, it is important to explore the critical aspects of OED. These aspects include the history of OED, key definitions regarding the security aspects of the OED system, the requirements that drove the acquisition process to install OED afloat, and a quick look at the alternatives available to answer those requirements.

1. History and System Overview

The problem of timely access to information at multiple security levels has challenged the computer security research and engineering community for several decades (Brenneman et al, 1997). Early efforts were focused on the development of high assurance security kernels by vendors. The resulting systems permitted controlled sharing of sensitive information by users at multiple security levels. These systems often used reference validation mechanisms with primitive interfaces that did not meet the users' desire for a highly responsive rich system interface.

The early 1980's ushered in the creation of complex applications and the notion of multi-level systems. Challenges included allowing users to view multiple security levels simultaneously, while minimizing, if not completely avoiding, modifications to underlying security kernels used to enforce mandatory security policies. It was demonstrated that complex functionality could be provided outside of the reference validation mechanism. In most cases these architectures were custom-built "one of" systems. This precluded the rapid development and fielding of such solutions.

However, the rapid growth and pervasiveness of the personal computers (PCs) and workstations and the proliferation of productivity tools in tandem has allowed new solutions to be introduced easily and cheaply. The use of information technology (IT) is no longer a luxury used by science and academia, but the premier tool for DoD and industry. DoD is making enormous investments in Commercial off-the-shelf (COTS) and

commodity PC products. This shift to COTS has lead to new requirements: the ability to incorporate patches and updates to existing COTS products and the ability to enlarge the desktop-based software suite as new products become available (*NAVSEA Instruction 9083.1-COMMERCIAL OFF THE SHELF (COTS) POLICY*, 2002).. Unfortunately, multi-level security solutions did not evolve at the same rate as personal computing. The problem for DoD systems includes not only the provision of access control and movement of data based on fixed sensitivity levels, but the preservation of compatibility with COTS, Government off-the-shelf (GOTS), and coalition application software. When protecting sensitive information is paramount, then the solution set is comprised of high-cost applications. In contrast, when compatibility with COTS/GOTS takes precedence, then instead of employing high cost trusted systems for timely information sharing; each access class is relegated to a separate information system or enclave. These independent "system high" enclaves are established by "air-gapping" the respective networks; using automated guards; or using replication schemes to achieve isolation.

The tragic events of September 11, 2001, highlighted the need for the rapid sharing of disparate sensitive information. The DoD is now faced with the challenge of getting mission-critical and time-sensitive information into the hands of people, DoD or non-DoD, which need it in a short period of time so it may be used effectively. Historically the information resided in information systems that did not provide access to persons outside the immediate community of interest (i.e. releasable FBI) and that information was carefully protected and guarded (9/11 Commission, 2004).

The DoD relies on information systems to support the missions of nearly every component organization. In most cases today, information is protected at the highest classification level of the data in the system, the system-high level. Unfortunately, the information is not readily accessible by persons not cleared to the system-high level, even though the information being sought may be of a lower classification level and thereby releasable to the requester.

Operating information systems in this manner often results in the over-classification of data, over-clearing of personnel, and system redundancies and

inefficiencies. This situation commonly exists throughout the DoD. What is needed is a means by which the actual security level of the information can be maintained and information can be appropriately protected, automatically processed, and efficiently distributed. Users also need timely access to the data and the various processing and communications resources that they require to accomplish their jobs (Myer & Patterson, 2003).

In addition, staff members need to access and fuse data and other resources that are available on several disparate systems to perform their duties. Each system usually has its own interface (e.g., via a specific set of terminals or workstations), thus requiring multiple terminals that take valuable space in command centers, offices, and computer rooms. The maintenance of these redundant databases is another unfavorable condition that results from using separate systems for each security level. Often a separate database must be created and maintained for each security level processed. The use of these multiple databases presents several operational problems. First, it fragments information. A collection of information regarding a specific event may be split across multiple systems of different security levels. Incomplete or misleading information may result unless pertinent data can be obtained from all related systems. Second, information of a lower classification may be unnecessarily upgraded in the higher-level systems, resulting in its over-classification and consequent limited access. As a result, duplication and multiple classifications of the same information occur. Third, the maintenance of multiple databases is staff and system administrator intensive and depletes valuable system resources. Because the data may change continually, updating data bases often results in inconsistent views of the current information across different levels. The constantly changing nature of the data, combined with human updating, often results in outdated information at one or more of the security levels.

One of the greatest drawbacks of having multiple systems operating at different security levels is the inability to share the computer and communication system infrastructures, such as cabling, network components, printers, workstations, and hosts. If sharing these resources were possible, equipment, operations, and maintenance costs

would decrease, and significant gains in overall system reliability could be increased (Miller, 2003).

2. Afloat Derived Requirements

As evidenced in Operation Enduring Freedom and Operation Iraqi Freedom, the US Warfighter is a member of a strong team of coalition partners all sharing the common goal of defeating terrorism and oppression. One critical aspect of winning this fight is the ability to share information across security domains while ensuring sensitive information is kept secure. This capability is termed Cross Domain Solutions (CDS) (COMSECONDFLT, 220115Z NOV 03). One end of the spectrum of CDS is to put all information in one domain so everyone has access to all the information at all times. This end of the spectrum ensures speedy access to critical information but it also eliminates protection for sensitive information such as source of information (i.e., sensor, human collection), precision of information (i.e., sensitivity of sensors), timeliness of delivery of information, bilateral agreements between allies (i.e., in order for Country A to use Country B's information, Country A agrees not to share Country B's information with Country C), and many other security/sensitivity issues. The other end of the CDS spectrum is to over-classify the data so one can ensure the sensitivity of the data but, in the process, eliminate the usefulness of the data by severely limiting access to the data.

A middle ground must be utilized to provide the Warfighter with the positives of both extremes while minimizing the risks of both extremes. This middle ground has resulted in the security domains present in today's DoD and coalition operations. The utilization of security domains presents three scenarios for information security/sharing: system-high, multiple single levels (MSL), and MLS (Myer & Patterson, 2003).

System-high: System-high systems do not address the security of individual pieces of data. In this scenario, all data is considered to be at the security level of the system. Therefore, the data is easily accessible to any user authorized at that security level but data can also be easily over-classified. For example, a piece of data classified as CONFIDENTIAL introduced into a SECRET system-high system will automatically become SECRET data. System-high systems also provide very limited bilateral

agreement compliance, thus again limiting the ability to share data with other coalition members.

MSL: MSL is a type of security comprised of relatively untrustworthy single level systems. Separation of data and trust is placed in controlled interfaces between the less trustworthy components. These controlled interfaces (e.g., guards and sanitizers) are typically smaller automated information systems running a dedicated program, providing a dedicated function. MSL implementations maintain multiple instantiations of servers, clients, applications, and databases to serve each security enclave and pass the data up or down using guarding and sanitization tools. Because of this, it is not uncommon to find three or more workstations in a single workspace aboard our ships (Myer & Patterson, 2003).

MLS: There are different aspects of MLS that must be addressed to fully understand MLS capabilities. There is external MLS – the ability to take information / intelligence from multiple, trusted, security levels and disseminate derived products out to multiple, trusted, security levels. There is internal MLS – the ability to restrict access to data on a network depending on the security level of the user. There is also MLS communications - systems that can take message traffic from multiple communications paths and transmit messages out via multiple communications paths.

The afloat requirement presented to the acquisition community by the USS Blue Ridge and the Commander, Carrier Group Seven (CCG 7) staff embarked on board was directly derived from CCG 7 post-deployment lessons learned analysis following operations in support of Operation Enduring Freedom. This requirement was further delineated in a series of reference messages identified in Table 1.

FLEET GENERATED REQUIREMENTS		
MSGID	**FROM**	**SUBJECT**
021132Z JAN 04	**COMENTSTRKGRU**	**OED MID-CRUISE REPORT**
- ABILITY TO RECEIVE, QUEUE, AND FORWARD RECORD MESSAGE TRAFFIC FROM UNCLASSIFIED THROUGH SCI COMPARTMENTS o HAS IMPROVED WATCHSTANDERS'AND LEADERSHIP'S ABILITY TO REVIEW TRAFFIC IN ONE PLACE WITHOUT HAVING TO ACCESS MULTIPLE SYSTEMS AND INDIVIDUAL QUEUES LEADING TO TIME SAVINGS AND INCREASED EFFICIENCY - MLS FUNCTIONALITIES FOR MESSAGE PROCESSING/HANDLING, LONG TERM TRACK DATA		

FLEET GENERATED REQUIREMENTS

ANALYSIS, ACCESS TO SCI INTELINK AND PRE-LOADED NATIONAL DATABASES, AND SCI CHAT

- ABILITY TO WORK WITH BOTH GENSER AND SCI MATERIAL ON ONE WORKSTATION

MSGID	FROM	SUBJECT
220115Z NOV 03	**COMSECONDFLT**	**SUBJ/OSIS EVOLUTIONARY DEVELOPMENT (OED) UPDATE (SERIAL 3): OED /FLEET INTELLIGENCE REQUIREMENTS**

- OED PROVIDES AN MLS ENVIRONMENT WHOSE FOUNDATION OFFERS A REALIZABLE OPPORTUNITY FOR A CROSS DOMAIN SOLUTION (CDS) THAT SPANS THE COLLATERAL AND SCI ENVIRONMENTS.

- INTELLIGENCE PRODUCTION AT THE SCI LEVEL, AND AUTOMATIC, RAPID, RELIABLE DISSEMINATION INTO THE COLLATERAL ENVIRONMENT OF THE WARFIGHTER

- WATCHSTANDERS SEARCH ARCHIVED MESSAGES FOR THEMATIC ISSUES AND KEYWORDS. THESE SEARCHES OCCUR ACROSS MULTIPLE SECURITY LEVELS, SAVING WATCHSTANDER TIME AND ALLOWING MORE TIME FOR ANALYSIS.

- DISSEMINATE DAILY AT/FP SUPPORT MESSAGE TO U.S. AND NATO AUDIENCE TAILORED TO C2F/CSFL RESPONSIBILITIES

- AUTO-DISTRIBUTE ALL-SECURITY LEVEL MSG TRAFFIC AND SCI E-MAIL

MSGID	FROM	SUBJECT
151130Z SEP 03	**USS BLUE RIDGE**	**SUBJ/JOINT MESSAGE HANDLING SYSTEM (JMHS) REPLACEMENT**

- POWERFUL MESSAGE HANDLING SYSTEM IS THE OSIS EVOLUTIONARY DEVELOPMENT (OED) SYSTEM THAT WAS RECENTLY INSTALLED IN SUPPORT OF SCI/GENSER INTELLIGENCE MESSAGE HANDLING.

MSGID	FROM	SUBJECT
180901Z SEP 03	**JAC MOLESWORTH**	**OED PROGRAM SUPPORT**

- REQUESTS CONTINUATION OF OED RDT&E, OMN, OPN SUPPORT DUE TO THE CRITICALITY OF OED TO THE JAC'S MISSION.

MSGID	FROM	SUBJECT
211846Z AUG 03	**COMLANTFLT / N2/N3**	**OED SUPPORT TO THE FLEET**

- COMLANTFLT REQUIRES CONTINUED CONTACT REPORTING AND REQUESTS JFIC CONTINUE TO HOST [OED] AND OPNAV N612, ONI-4 AND PMW-157 CONTINUE TO REOURCE THIS CRITICAL SUPPORT TO THE FLEET."

MSGID	FROM	SUBJECT
030845Z JUL 03	**C7F**	**FLEET BATTLE EXPERIMENT KILO QUICKLOOK**

- JOINT FIRES….A RAPIDLY RECONFIGURABLE AND RELIABLE TECHNOLOGY THAT CAN QUICKLY MEET SECURITY APPROVALS MUST BE IN PLACE SO THAT COALITION PARTNERS CAN ARRIVE IN AN AOR AND QUICKLY BECOME PARTICIPANTS IN AN EXISTING FIRES NETWORK.

FLEET GENERATED REQUIREMENTS

MSGID	FROM	SUBJECT
281346ZMAR03	**CFFC N6 / N2**	**FLEET REQUIREMENTS FOR A MULTI LEVEL SECURE (MLS) SOLUTION**

- IN TODAY'S ENVIRONMENT OF TIME SENSITIVE AND COALITION OPERATIONS, A MLS SYSTEM IS INCREASINGLY IMPORTANT TO IMPROVE COMMUNICATION EFFICIENCY AND INCREASE SPEED OF INTELLIGENCE EXCHANGE AMONG ALLIES AND COALITION PARTNERS

- A SINGLE NETWORK EQUIPPED WITH COMMON APPLICATIONS THAT HANDLES AND AGGREGATES DATA OF VARIOUS SECURITY LEVELS ACROSS BOTH SCI AND COLLATERAL DOMAINS WITHIN AN ACCREDITED MLS ARCHITECTURE / OPERATING SYSTEM.

MSGID	FROM	SUBJECT
281159Z MAR 03	**C2F/C3F**	**NUMBERED FLEET TOP TEN INFORMATION TECHNOLOGY REQUIREMENTS**

- MULTIPLE LEVEL SECURITY SHOULD PROVIDE THE FULL RANGE OF COLLABORATION CAPABILITIES ACROSS NUMEROUS NETWORKS OF DIFFERENT SECURITY CLASSIFICATION LEVELS, TO INCLUDE SEAMLESS EXCHANGE OF EMAIL, WEB PRODUCTS, FILE SHARING AND CHAT.

MSGID	FROM	SUBJECT
111450Z MAR 03	**COMSECONDFLT**	**SCI NETWORK SUPPORT REQUIREMENTS**

- TAILORED MULTI-LEVEL SECURITY SUPPORT TO TACTICAL UNITS

MSGID	FROM	SUBJECT
262206Z FEB 03	**COMENTBATGRU**	**REQUEST FOR OED INSTALLATION**

- REQUEST TO C2F FOR SUPPORT OF OED INSTALLATION ONBOARD USS ENTERPRISE (CVN 65)

MSGID	FROM	SUBJECT
211942Z FEB 03	**COMSECONDFLT (COORDINATED COMSECONDFLT / COMTHIRDFLT MESSAGE)**	**SEA POWER-21 IMPLEMENTATION MESSAGE NR-3; OPERATIONAL AGENT REQUIRED WARFIGHTING CAPABILITIES LIST (U)**

- MULTI-NATIONAL COMMAND AND CONTROL INTELLIGENCE INFORMATION MANAGEMENT, ANALYSIS, AND FUSION SUPPORT TOOLS MULTI-LEVEL SECURITY STANDARDIZED COALITION IT CONNECTIVITY"

MSGID	FROM	SUBJECT
101447ZDEC02	**COMSECONDFLT**	**OSIS EVOLUTIONARY DEVELOPMENT (OED) AFLOAT: EVALUATION**

- ENABLE INTELLIGENCE SUPPORT TO COALITION OPERATING ENVIRONMENTS

- ABILITY TO OPERATE IN THE MULTI-NATIONAL ENVIRONMENT

- ABILITY TO RECEIVE AND MANIPULATE IMAGERY ACROSS SECURITY DOMAINS

- MLS DATABASE TO HAVE HTML DATA-CONTENTS TAGS AS WELL AS SECURITY LABELS

- ABILITY TO INTERFACE WITH COALITION INTELLIGENCE DATABASES

FLEET GENERATED REQUIREMENTS

- PRESERVE THE ORIGINAL NATO RELEASABILITY OF THIS INFORMATION AS IT IS FUSED IN AN ALL-SOURCE INTELLIGENCE ENVIRONMENT.

MSGID	FROM	SUBJECT
132202ZAUG02	**COMTHIRDFLT**	**JCSBG INTELLIGENCE LESSONS LEARNED**

- STRONGLY ENDORSE THE CONTINUALLY IDENTIFIED FLEET REQUIREMENT FOR A MULTI-LEVEL SECURITY SYSTEM AFLOAT

MSGID	FROM	SUBJECT
021820ZAUG02	**COMCARGRU 7**	**EQUIPMENT - LACK OF A MULTI-LEVEL SECURITY SYSTEM AFLOAT IDCLS/L/12373-20899/U// ORIG/CCG7/LCDR GREG HUSMANN**

- TIMELY EXCHANGE OF INTELLIGENCE BETWEEN MANY COALITION MEMBERS

- THE REQUIREMENT EXISTS FOR A SINGLE WORK STATION EQUIPPED WITH COMMON INTELLIGENCE APPLICATIONS ACROSS THE FULL SPECTRUM OF POTENTIAL SECURITY CLASSIFICATION LEVELS

- CAPABLE OF PROCESSING AND EXCHANGING DATA AT THE DESIRED CLASSIFICATION LEVEL USING STANDARD APPLICATIONS:

MSGID	FROM	SUBJECT
180235Z DEC 01	**COMSECONDFLT**	**SCI GCCS-M LAN UPGRADE REQUIREMENTS**

- AUTOMATED MESSAGE HANDLING / MULTI-SECURITY LEVEL INFORMATION MANAGEMENT
    - SINGLE, AGGREGATED, MULTI-SECURITY LEVEL DATABASE SUPPORT
    - MULTI-SECURITY LEVEL WEB SERVICES
    - ALL-SECURITY-LEVEL LAND/AIR /MARITIME (MERCHANT/SURFACE/ SUBSURFACE) TRACK MANAGER WITH HISTORY AND TREND ANALYSIS CAPABILITY
    - A SECURITY LAN INTERFACE BETWEEN U.S. AND NATO/COMMMONWEALTH SYSTEMS.

MSGID	FROM	SUBJECT
211442ZMAY 01	**CINCLANTFLT N6A**	**CINCLANTFLT MULTI SECURITY LEVEL-MULTI LEVEL SECURITY (MSL-MLS) FOCUS WORKSHOP RESULTS**

- MSL-MLS SYSTEMS MUST PROVIDE:
    - REDUCED HULL, MECHANICAL AND ELECTRICAL (HM&E) SHIPBOARD FOOTPRINT
    - ABILITY TO SECURELY EXCHANGE DATA BETWEEN USERS/SYSTEMS THAT PROCESS DATA ON DIFFERENT CLASSIFICATION LEVELS
    - ABILITY FOR MSL-MLS TO OPERATE IN BANDWIDTH CONSTRAINED ENVIRONMENTS
    - ABILITY FOR MSL-MLS TO OPERATE IN DEGRADED ENVIRONMENT

MSGID	FROM	SUBJECT
272118ZFEB01	**COMSECONDFLT**	**FLEET REQUIREMENTS FOR MULTI LEVEL NETWORKS**

FLEET GENERATED REQUIREMENTS
- ACCELERATED DEVELOPMENT AND FIELDING OF FULL CONTENT-BASED MLS SOLUTIONS.

Table 1. Navy CDS Requirements (Table 7, Appendix F)

USS Blue Ridge staff members specifically requested a MLS system that provided support for collaboration capabilities across numerous networks of differing security classification levels and IP connectivity to bilateral circuits, to include seamless exchange of email, web browsing, file sharing and chat services. The system additionally was required to provide for coalition support of a long-term OTH-T Track archive and Message archive for Intel analysis (USS Blue Ridge, 151130ZSEP 03).

B. ANALYSIS OF ALTERNATIVES

An analysis of numerous systems was conducted to determine the best solution set for the USS Blue Ridge's requirements. Although this analysis is not the subject of this thesis, a general discussion of the analysis will introduce systems, terms, and engineering concepts and thus provide background for the afloat installation of OED.

The first step in determining a set of plausible solutions is to analyze the CDS spectrum for the correct technologic approach. As discussed above, the best subset of solutions are found in the MLS technology. System-high solutions result in separate security domains that can be bridged by operator action only. That action is frequently performed over an air gap and thus, is not properly audited. Auditing does not prevent security violations from occurring but the audit log does allow for more comprehensive troubleshooting and "clean-up" if a security violation occurs.

One way to introduce auditing and to simplify (even to the point of automating) the transfer of data across security domains is the implementation of guards in the architecture (Kane, 2002). This approach was identified above as MSL. MSL is a very favorable solution in some scenarios but there are still issues. The guards are connecting two or more system-high security domains thus introducing all the issues with system-high architectures discussed above. The guards themselves must ensure downgraded data has been sanitized to the security level of the destination domain. This often results in

data fields being eliminated or manipulated, thus resulting in loss of data, data synchronization issues across domains, data correlation issues, and increased data management. There is a cost issue with MSL, too. The common MSL architecture has duplicative architectures in each domain with a guard between domains. Therefore, it is conceivable that an architecture consisting of five servers and five workstations (a total of ten "boxes") could be duplicated for every coalition domain and every United States security domain in addition to the guarding devices between each domain.

The best alternative is an MLS solution. MLS allows data to be accessed from multiple classification levels while being persisted at a specific level of classification utilizing labels for each piece of data (Myer & Patterson, 2003). These labels maintain the classifications and releaseability information attributed to that data. Therefore, assuming data is not altered while being accessed, the data remains at its original classification level and does not have to pass through a "guarding" function where data loss/manipulation may occur. The use of labels also allows for bilateral agreement compliance, releaseability rules compliance, and the ability to utilize data to derive correlated products while still maintaining the original classification of the data pieces. This is the most important aspect of MLS technology.

In order to better understand this aspect, one must first look at the three states of data that any MLS solution must address. There is data in transit and that state is addressed with MLS communications (the ability to pass data at different security domain levels on one network or communications path). The second state of data is data at rest; for example, data in storage. This state is addressed by an MLS database that allows data at different security levels to be stored in one database. The last state of data is "in process." Data in process is data undergoing some operation. It could be an operation as simple as property comparison or as critical as correlation and fusion of a large set of data. Today's Warfighters rely on C2I systems to process the enormous amount of data received from sensors in order to gain situational awareness of the battle space around them. It is virtually impossible for Warfighters to carry out the task of correlating incoming data in order to maintain a Common Operational Picture (COP) that can be

shared around the battle space and up and down the chain of command. Any CDS solution must address the ability to handle the "in process" state of data in order to give the Warfighters the products they need to fight the war. There is only one accredited MLS C2I system in DoD and that system is OED. OED allows the Warfighter to apply correlators on the entire set of data available to the Warfighter in spite of what security domain he may be working in because OED's correlators work against an MLS database that contains every piece of data received in every security domain. This eliminates disparate COPs in different security domains. It also prevents incorrect correlation found in a system-high architecture because, in that architecture, the correlator working at the SECRET level is not aware of TOP SECRET data in this architecture. The Warfighter is relying on a correlation process applied on a subset of the data. Even when an MSL guarding solution is added to the system-high architecture, the data loss found in passing data through a guard still prohibits the correlator from utilizing the entire set of data available (Newcomb, 2003).

Although it would appear the key system to a successful Coalition architecture is OED afloat, there are other systems and issues to consider. The following systems were selected for the USS Blue Ridge architecture in the analysis of alternatives:

1. Global Command and Control System – Maritime

Global Command and Control System – Maritime (GCCS-M) is the Command and Control component of the Navy's Command, Control, Communications, Computers and Intelligence/Surveillance and Reconnaissance (C4ISR) systems (GCCS-M ORD, 1999). The system supplies information that aids Navy Commanders in a full range of tactical decisions. In functional terms, GCCS-M fuses, correlates, filters, and maintains raw data and displays image-building information as a tactical picture. Specifically, the system displays location of air, sea, and land units anywhere in the world and identifies whether those units represent friendly, neutral or enemy forces. It operates in near real-time and constantly updates unit positions and other situational awareness data. GCCS-M also records the data in appropriate databases, and maintains a history of the changes to those records. The user can then use the data individually or in concert with other data to

construct relevant tactical pictures, using maps, charts, map overlays, topography, oceanographic, meteorological, imagery and all-source intelligence information all coordinated into the COP. The picture is referred to as common because once constructed it can be shared with joint users who need the information. Supplied with this information, Navy and Joint Commanders can review and evaluate the general tactical situation, determine and plan actions and operations, direct forces, synchronize tactical operations, and integrate force maneuver with firepower. The system operates in a variety of environments and supports joint, coalition, and allied forces (Rodriguez, 2004). A graphical depiction of GCCS-M is provided by Figure 1.

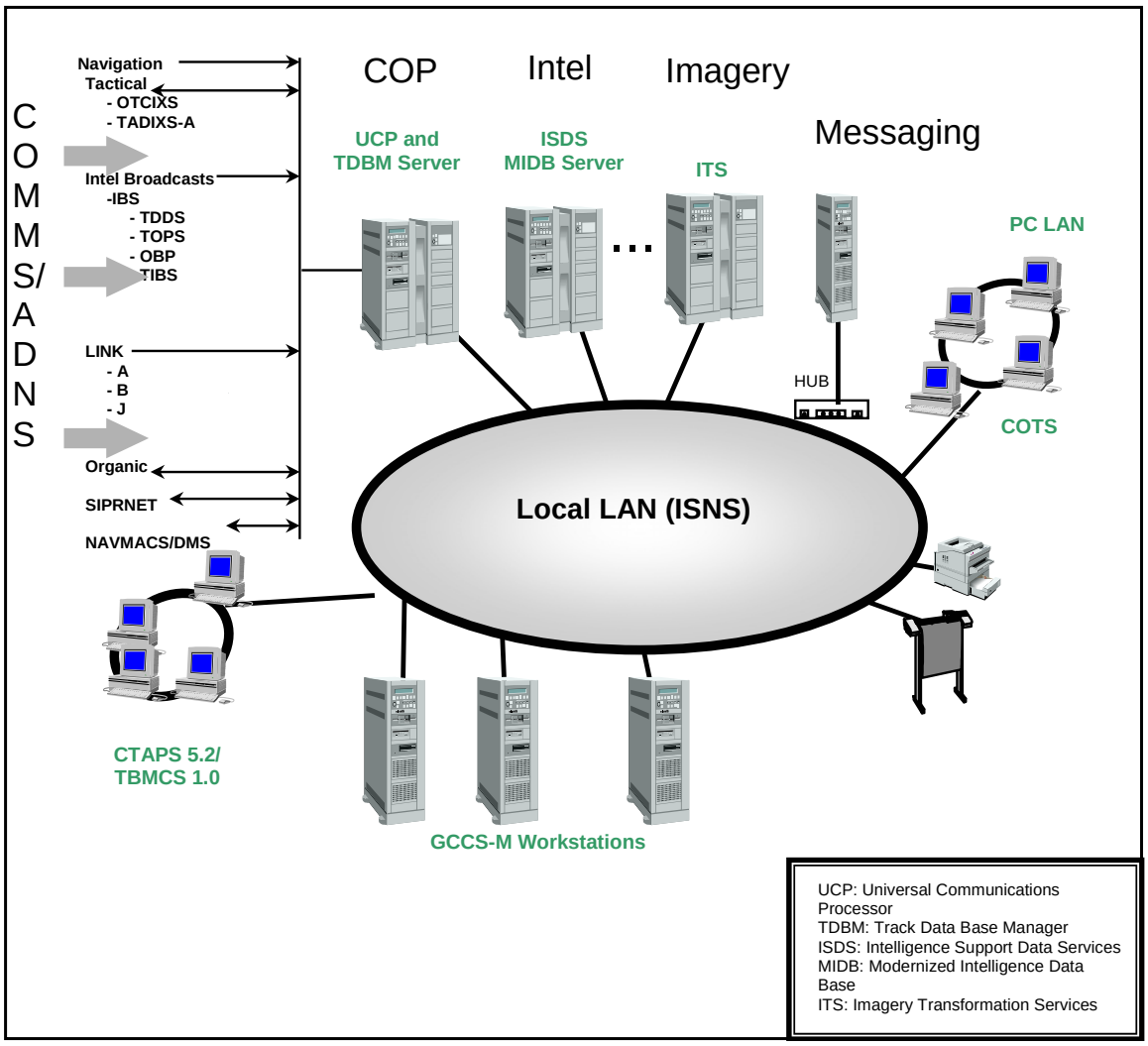


Figure 1. GCCS-M Architecture (From Rodriguez, 2004)

2. Radiant Mercury

Radiant Mercury (RM) is a certified and accredited system that provides a large array of CDS services to the Warfighter. RM provides for automated sanitization and guarding between security boundaries, downgrading services to allow an operator to move data into a lower classification level, format transliteration (automatically change message formats, units, etc.), tools to facilitate releaseability to our Coalition partners, complete audit records for information assurance and security, and post-event

reconstruction tools. RM is in the Coalition afloat architecture in two roles: a sanitization and guarding tool between the SCI and General Service (GENSER or SECRET and below security levels) GCCS-M systems and as a downgrading tool inside the OED system (Kane, 2002).

3. Ocean Surveillance Information System (OSIS) Evolutionary Development (OED)

OED passed operational testing in 1998 and has successfully completed security accreditation 48 times since initial fielding. It is fielded at the Joint Intelligence Centers in Hawaii and Norfolk and at the Joint Analysis Center at Molesworth, England. It is also the foundation of the C2I architectures in four allied countries (Newcomb, 2004). The system supports command, control and intelligence assessment, including indications and warning (I&W) and power projection; maintains dynamic databases to support a common air, land, sea and littoral battlefield picture using ground force and maritime symbology; provides access to multiple communications networks for inter-force compatibility and interoperability that support database sharing and data analysis; and supports Joint Task Force commanders, Theater Commanders (COCOMs), service components and subordinate units. OED operates in an MLS DII COE architecture, providing local and global networking for on-demand services and timely response to consumer requests for fused intelligence. OED supports joint Air Force, Army, Navy, Marine Corps, and Coast Guard operations with additional tasking to support counter-terrorism, counter-narcotics and allied coalition operations. Figure 2 depicts a line drawing of the connectivity provided in a generic OED architecture.

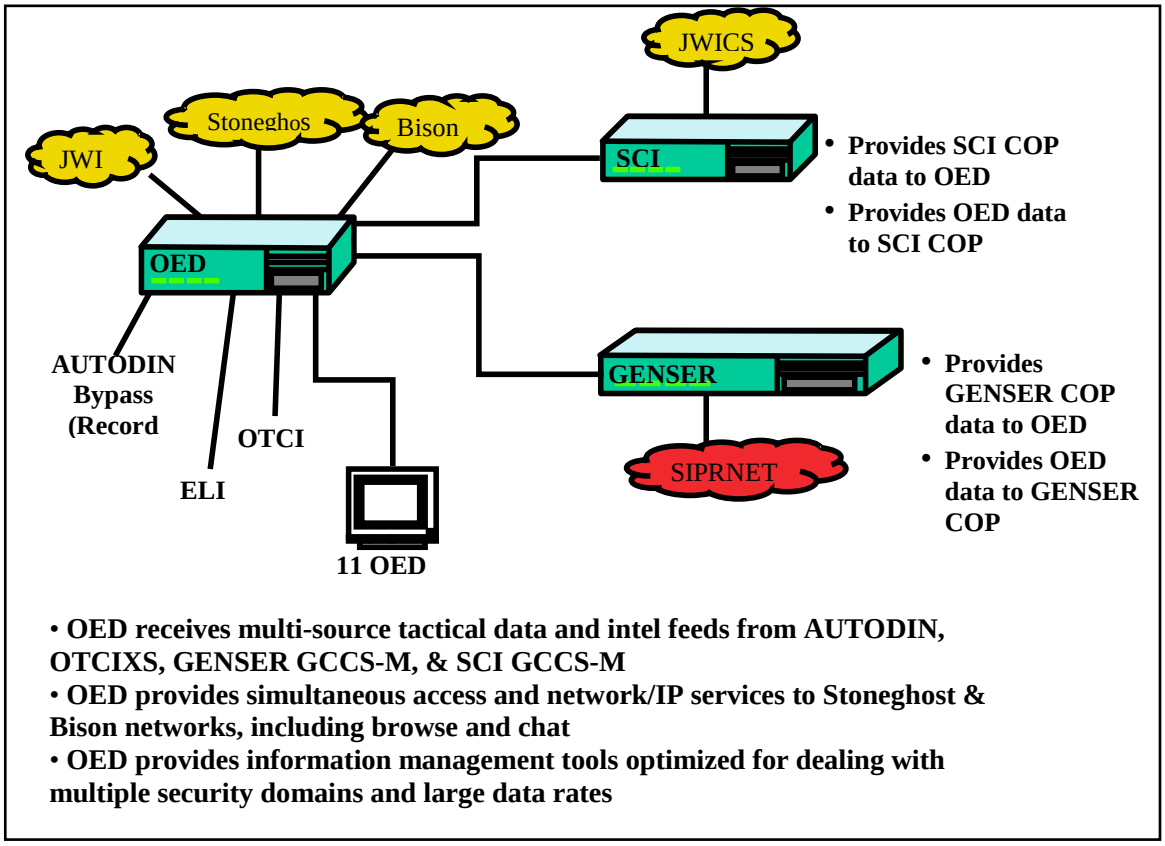


Figure 2. Generic OED Architecture (From Fish, 2004)

4. Global Command and Control Systems – Integrated Imagery and Intelligence (GCCS-I^3)

Global Command and Control Systems – Integrated Imagery and Intelligence (GCCS-I³) provides COP–centric intelligence and imagery-related capabilities developed by the four military Services and selected Agencies in response to Joint Warfighter requirements. Through the GCCS- I^3 integration process, these tools provide Intelligence Support to Operations seamlessly within the GCCS family of systems.

GCCS- I^3 enhances the operational commander's situational awareness by providing a standard set of integrated, linked tools and services which give ready access to imagery and intelligence directly from the operational display. This capability is used to combine the vast resources of the tactical, operational, and national intelligence

community with critical command and control information. This results in an unprecedented level of streamlined intelligence support to operations.

GCCS- I^3 gives tactical operators and intelligence analysts direct access to the nationally produced Modernized Integrated Database (MIDB) for Order of Battle (OOB) data, weapons systems' characteristics and performance information, and national imagery. GCCS- I^3 also gives those users the capability to integrate locally collected tactical imagery and other intelligence with national and theater-produced intelligence. This intelligence can be plotted directly on operational/tactical displays alongside continuously updating operational and operational-intelligence information, providing tactical operators and intelligence analysts vastly improved knowledge of the battle space (Newcomb, 2004). Figure 3 identifies the Joint components of the GCCS-I^3 suite of intelligence and imagery tools.

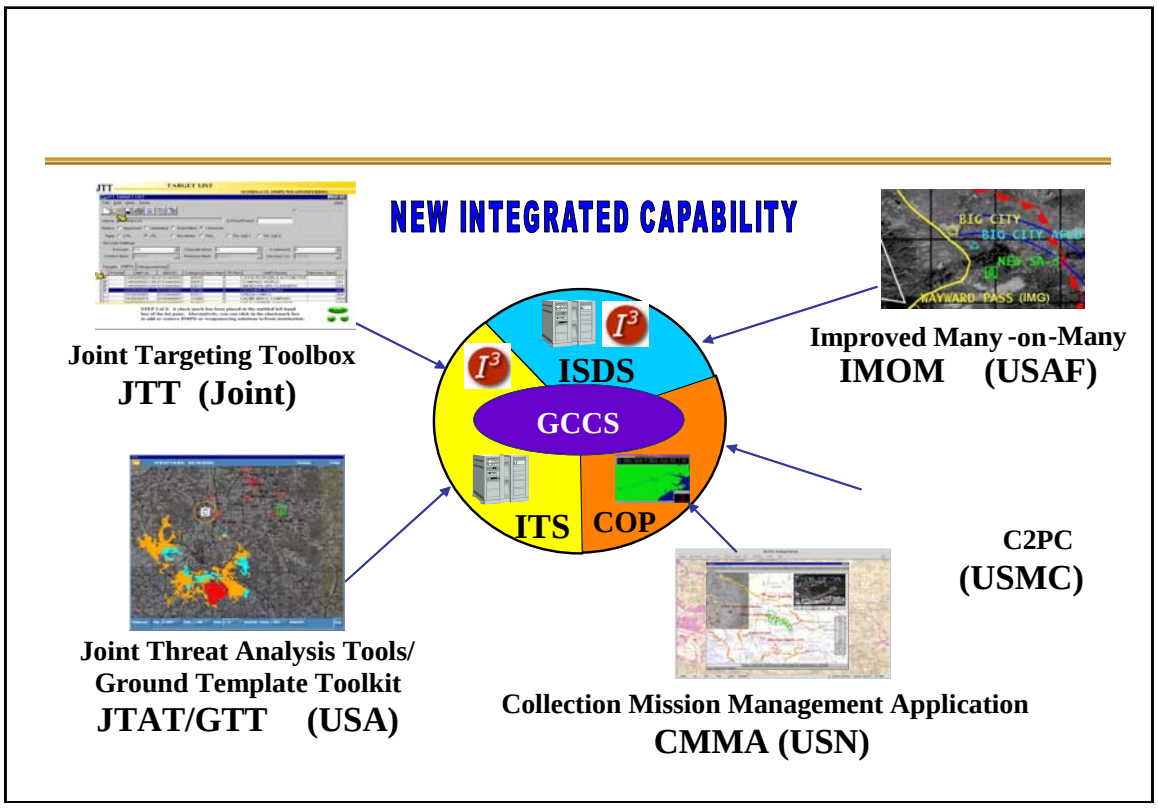


Figure 3. GCCS-I^3 v3.6 applications from the various Services (From Newcomb, 2004)

5. Defense Information Infrastructure Common Operating Environment

The Defense Information Infrastructure Common Operating Environment (DII COE) provides a foundation for building interoperable systems through the use of reusable software components (building blocks). The DII COE can be characterized as a number of things, depending upon one's point of view. It is an architecture, a collection of reusable software elements, a software infrastructure, and a set of guidelines and standards. More importantly, however, is that it provides a common platform (or foundation) for building interoperable systems. Therefore, one could think of the DII COE as a component of system architecture, as it is an implementation of the Joint Technical Architecture (JTA). One could also think of the DII COE as an approach to software development — how to go about building interoperable systems on a common platform. Finally, it is important to realize that the DII COE is not a system, but a set of building blocks from which a system can be built. GCCS, Global Combat Support System (GCSS), and service unique programs (like the Air Force's Theater Battle Management Command and Control Systems (TBMCS)) are building their systems on top of the DII COE foundation (Sardosky, 1997).

DII COE is a software infrastructure, a collection of reusable software components, a set of Application Program Interfaces (APIs), and a series of specifications and standards for developing interoperable systems.

The DII COE taxonomy defines two layers of reusable software components: infrastructure services, which include the DII COE kernel services, and the underlying COTS operating systems. Infrastructure services address the movement of data through the network and include distributed computing and web services. The kernel provides low-level services, including a desktop environment, runtime tools, and basic system and security administration. Common support applications provide services that address

common command and control functionality, for example, mapping and message processing (Sardosky, 1997).

Standard APIs provide the interfaces between mission applications and reusable software components of the DII COE. Mission applications are developed on top of the DII COE and provide mission domain specific functionality.

Since GCCS-M, GCCS- I^3, and OED are all DII COE based systems, one alternative addressed was the integration of OED and the GCCS- I^3 suite of tools that could then be utilized by the GCCS-based systems such as GCCS-M. This alternative is very promising because both OED and GCCS- I^3 are DII COE systems utilizing the Hewlett Packard UNIX (HPUX 10.20) kernel. Both rely on the MIDB database for intelligence data, the Imagery Transformation Services database for imagery, and the Track Database Manager/Track Management System (TDBM/TMS) for tracks. This is critical since OED has MLS-enabled both the TDBM and the MIDB. From a systems engineering perspective, another viable alternative would be to integrate GCCS- I^3 applications into the OED system. Since the GCCS- I^3 "system" is truly just a collection of applications operating on a common kernel, the integration of these applications upon OED's kernel is relatively simple. Also, this allows the developer to allow the operator to utilize the GCCS- I^3 tools in a trusted fashion to add value to the trusted intelligence data. This is critical to optimizing the functionality of the GCCS- I^3 tools and thus, getting the most out of the trusted data.

From the Fleet perspective, it is important to review the requirements the Fleet has levied on acquisition world. The Fleet has asked for MLS functionality now (as referenced in Table 1) and the only MLS C2I solution available to the Joint Warfighter is OED. The Fleet has also asked for increased capability in the GCCS-I^3 toolset (CFFC N2/N6, 281346ZMAR03). The OED and GCCS-I^3 integration solution provides the Fleet with the MLS capability they desire and the GCCS-I^3 value-added functionality they desire. This is a very good approach from the Fleet perspective.

Another approach is the integration of OED's MLS technology into GCCS- I^3. This approach, again, makes sense from a systems engineering perspective. The original

concept behind OED was the implementation of MLS onto a DII COE-based system. Plus, this approach would allow the MLS capabilities to be implemented on the current DII COE and on the current operating system (Solaris). However, due to the "obsolescence" (Myerriecks, Defense Information Systems Agency (DISA) Chief Technology Officer, 2004) of the GCCS architecture and the push to provide enterprise services in the next generation C4I system (the Joint Command and Control System (JC2)), the web services found in JCDX (OED's successor and the "CDS cornerstone" (M. Cherry, comments at the JCDX Horizontal Fusion Quarterly Status Review, January 16, 2004) of the future C2I architectures) were deemed a better alternative to re-engineering the DII COE.

6. Multi-Level Thin Clients

One critical issue of presenting multiple security levels to the Warfighter is the number of monitors required to view each level that the Warfighter is authorized to access. This could result in four or five monitors on one desk for one operator to utilize. Of course, this presents a space and power issue plus an operational issue of trying to correlate all the data manually across the displays. One solution for space and power constraints is a multi-level thin client (MLTC) operator position. The MLTC fuses several secure networks into one slim workstation consisting of a monitor and a thin client interface. By design, the MLTC replaces the multiple monitors and PCs on a user's desk, and lowers hardware maintenance requirements. It also reduces the power footprint by not having to plug in multiple PCs and it helps with system administration. With the removal of the PCs, everything can be controlled from a server (SPAWAR, 2002).

By design, MLTC terminals have no transportable storage capability such as flash memory stick, CD-ROM, or even floppy disk devices. By reducing access points, the network becomes more secure because users cannot introduce unauthorized media on the network. Based upon individual user clearance levels, operators have access to multiple and independent networks at once in separate windows on the same monitor, with data pulled from widely disparate enclaves. With the use of "smart" Common Access Cards

(CACs), users can move between MLTC clients without having to reset their profiles. This saves users time as they move from workstation to workstation in support of the mission. An additional benefit to the system administrators is the ability to install application software on the server vice on multiple PCs. MLTC clients then access the server to provide the tools and functions of the various applications. A representative MLTC architecture is represented in Figure 4.

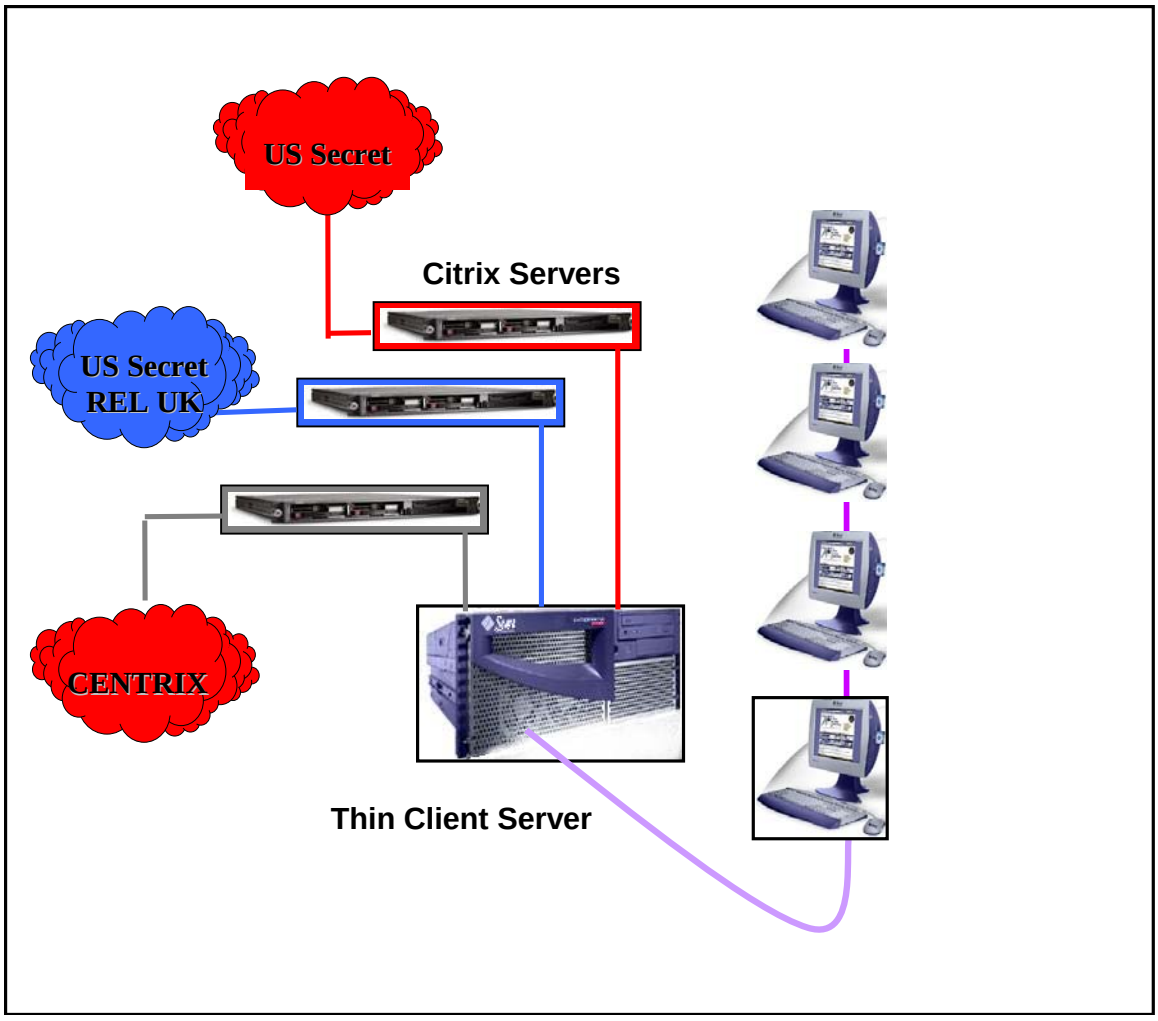


Figure 4. General MLTC architecture reflecting the use of session servers for each domain (From SPAWAR, 2002)

7. Combined Enterprise Regional Information Exchange System (CENTRIXS)

CENTRIXS is a global multinational information sharing network fielded to provide a common network for coalition forces to share data. CENTRIXS is web-centric and COTS oriented. Implementation focused on fielding core information services first: e-mail with attachments, web-browser-based data access, and file sharing. Other required services, including collaboration and near-real time data access, will be enabled as the network matures. To the extent possible, CENTRIXS will subsume and consolidate existing stove-piped coalition networks as part of a single, unified system (Miller, 2003).

The basic mission of CENTRIXS is to support intelligence and operations information exchange and sharing through reliable communications connectivity, data manipulation, and automated processes for bilateral or multi-lateral database access and information exchange among cooperating nations and international organizations. Specifically, the system provides Combatant Command decision makers, commanders, and units with:

- the COP
- Electronic mail (e-mail) with attachments
- Common Intelligence Picture (CIP)
- Synchronization of the actions of air, land, sea, space, and special operations forces
- Web-enabled services, office automation, and bulletin boards
- Secure Voice
- Support for US and coalition exercises

CENTRIXS uses existing communications infrastructures, such as the SIPRNET, whenever possible. The system employs NSA-Approved Type-1 encryption devices and sends an encrypted signal from Area of Responsibility (AOR) locations (strategic or tactical) to either a Gateway Forward Point of Presence (FPoP) site or to the command headquarters. This is accomplished using four different basic types of network configurations. The first type is a bilateral network, in which one nation and the US participate in sharing information. The second type is the FPoP, in which an entire server suite is installed in the region and acts as a hub or gateway for CENTRIXS users in the AOR. The third type is the deployable CENTRIXS network, which provides just the

essentials necessary to complete the mission: two servers and 12 laptops stored in transit cases for mobility. The deployable CENTRIXS can access the CENTRIXS network by tunneling through the SIPRNet or another available communications path. The fourth type is a command headquarters configuration. The command headquarters suite connects to any/all of the other three configurations referenced above and contains a suite of servers that provides CENTRIXS services. (JITC, 2004). The afloat Coalition architecture for CENTRIXS Block I is shown in Figure 5.

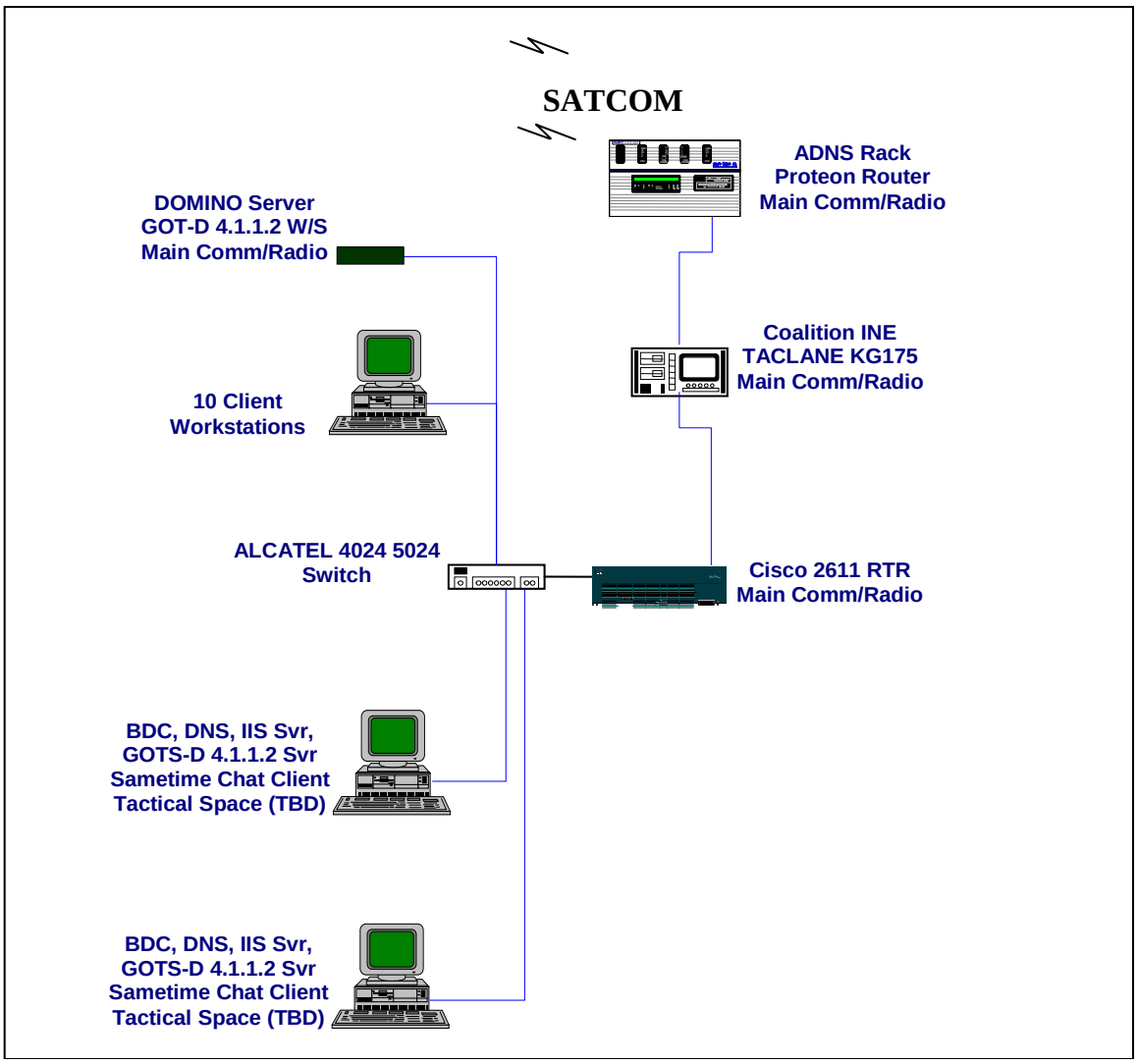


Figure 5. CENTRIXS Block I Coalition Architecture (From Miller, 2003)

C. AFLOAT ARCHITECTURE

After extensive research and analyses, the SPAWAR team determined the best approach for a coalition architecture afloat was a combination of OED, GCCS-M, RM, MLTC, and CENTRIX (also known as the Coalition Wide Area Network (COWAN) at that time). This combination is depicted in Figures 6 (the CENTRIXS/COWAN

architecture with MLTC) and 7 (the OED architecture connected to the COWAN/MLTC architecture). In this architecture, there are two OED systems installed – one on the SCI, or "high" side, and one on the GENSER, or "low", side. Both OED systems provide MLS services to the U.S. Warfighters on the high and low sides via the JWICS communications channel on the high side and via the SIPRNET, GCCS-M, MLTC, and COWAN/CENTRIXS communication links. Support to the Coalition Warfighters is also available on the high side with BISON and STONEGHOST communications and on the low side with COWAN/CENTRIX networks. The communications involved in the CDS architecture are listed in Table 2. Although this proposed architecture provided the best alternative for an afloat architecture by addressing cross domain solutions for data at rest, in transit, and in process; the actual architecture installed did not match this proposal. That issue will be explored in greater detail in Chapter 4's discussion of the installation of the OED TEMPALT. An understanding of the TEMPALT process is also very beneficial to gathering lessons learned from the OED installation on board LCC-19 (Brenneman & Kwiatkowski, 2003 and Miller, 2003).

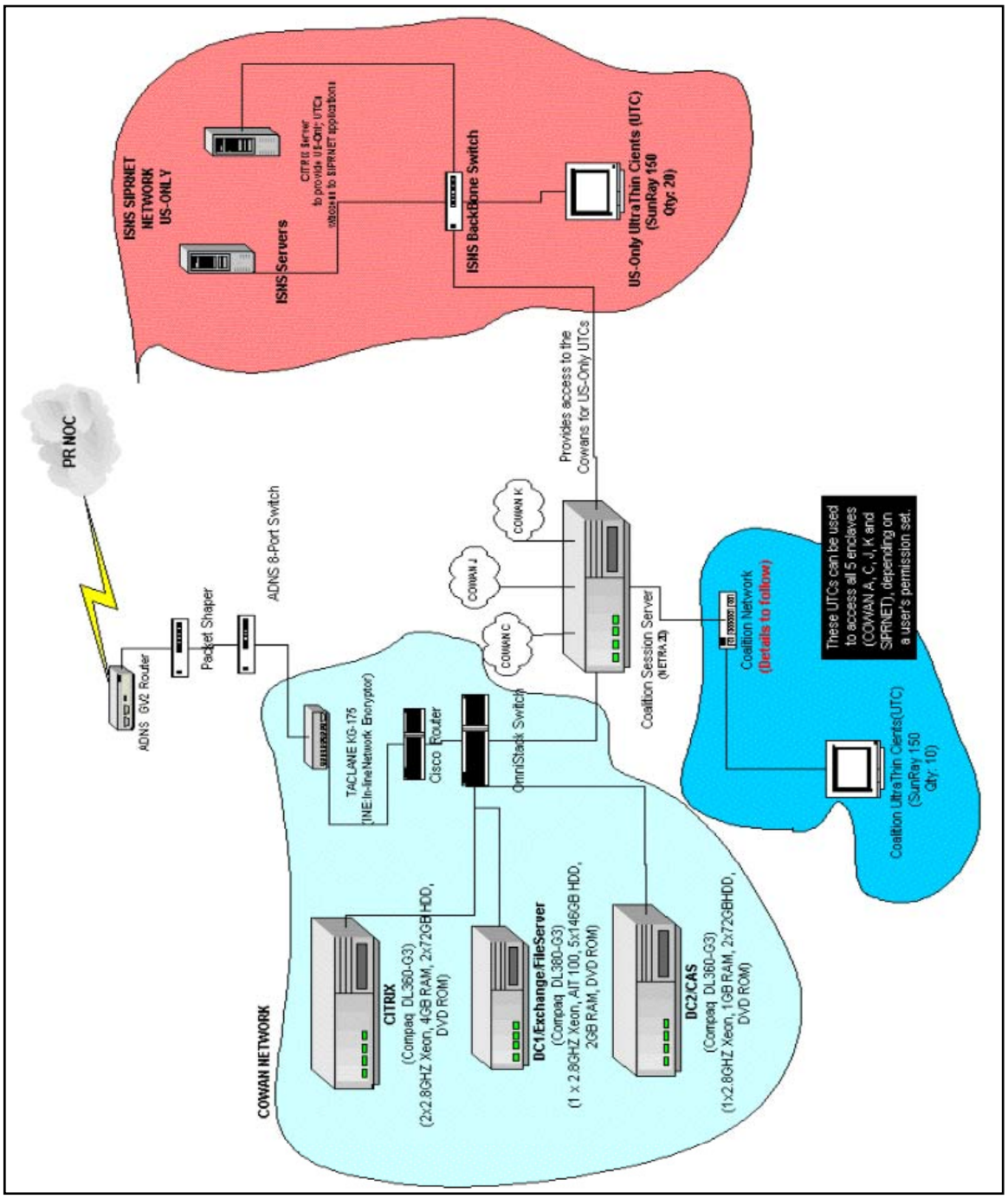


Figure 6. CDS Afloat Architecture, part 1: CENTRIXS/COWAN architecture with MLTC(From Brenneman, 2003 and Miller, 2003)

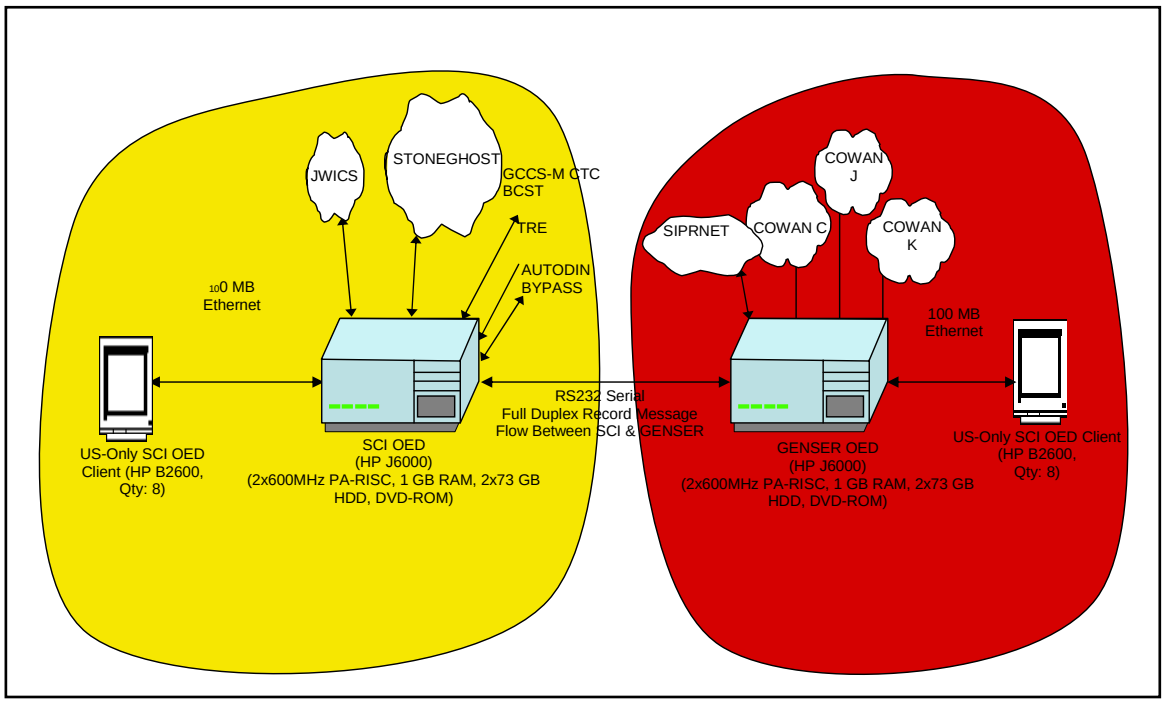


Figure 7. Afloat CDS Architecture, part 2: OED Servers and interfaces (From Brenneman & Kwiatkowski, 2003 and Miller, 2003)

Communications Name	Definition	Comments
JWICS	Joint Worldwide Intelligence Communications System	SCI network.
STONEGHOST	N/A	Used by close Allies for SCI intelligence
OTCIXS	Officer in Tactical Command Information Exchange Subsystem	Use for GCCS-M Track data (i.e., Contact Broadcast)
AUTODIN	Automatic Digital Network	Older network for message traffic, used with Allies
COWAN A, C, J, K	Coalition Operational Wide Area Network Allied, Coalition, Japan, Korea	Different COWANs used for different bilateral agreements
SIPRNET	Secret Internet Protocol Router Network	US Only, GENSER only
TRE	Tactical Receive Equipment	SCI intelligence reporting channel

Table 2. Major Communications channels in CDS Architecture (From Brenneman & Kwiatkowski, 2003 and Miller, 2003)

III. NAVSEA SHIPBOARD INSTALLATION PROCESS

A. INTRODUCTION OF INSTALLATION REQUIREMENTS

This section discusses requirements for Space and Naval Warfare Command (SPAWAR) program alterations in conjunction with the Naval Sea Systems Command (NAVSEA) Fleet Modernization Program (FMP) for alterations to Navy platforms. NAVSEA maintains detailed instructions for accomplishing alterations to ships and equipment specified in the Fleet Modernization Program Management and Operations Manual (NAVSEA, 2002).

The FMP Shipboard Installation process (hereafter referred to as the FMP process) was established to provide a structure for the orderly identification, approval, design, planning/programming, budgeting, and accomplishment of improvements that increase the capability or reliability of a ship to perform its assigned mission in accordance with OPNAVINST 4720.2G (CNO, 1995). The FMP process addresses different installation alternatives to shipboard configurations. The alternatives available to SPAWAR programs include permanent ship alterations, temporary ship alterations, hardware field changes or software engineering changes, defined in SPAWARINST 4720.3C (SPAWAR, 1998). More detailed discussion for each of these alteration options follows in the remainder of this introduction (Nowicki, 2004).

A permanent Ship Alteration (SHIPALT) is required when the proposed change results in any of the following five conditions (NAVSEA, 2002):

a. Alteration upgrades existing systems or provides additional capability that necessitates changes in form, fit, or function to component parts of the ship.

b. Alteration yields increased power adjustments

c. Alteration requires additional heating, ventilation, or air conditioning (HVAC)

d. Alteration requires additional cooling (water cooling)

e. Alteration results in changes to external cabling

If the alteration is deemed temporary, the temporary alteration (TEMPALT) process may be used. A TEMPALT is any alteration that provides new or improves existing capabilities on a temporary basis supporting Research Development, Test and Evaluation (RDT&E) alterations, or military exercise, or mission requirements. The purpose for these alterations is to demonstrate and test new concepts while evaluating effectiveness in an operating environment. TEMPALTS are constrained to a period of less than one year, or scheduled for a platform's single operational deployment (NAVSEA, 2002).

If a permanent alteration change does not fall into the categories (a through e) above, then the Field Change (FC) or Engineering Change (EC) alternatives and their reduced documentation requirements are appropriate. The Field Change (FC) process is applicable for internal changes (mechanical and/or electrical) to an equipment rack or system assembly as long as no external adjustments are required to a ship's configuration. The Engineering Change (EC) process should be used if the product is a software release or upgrade (NAVSEA, 2002). Figure 8 identifies a process flow to determine the appropriate type of alteration.

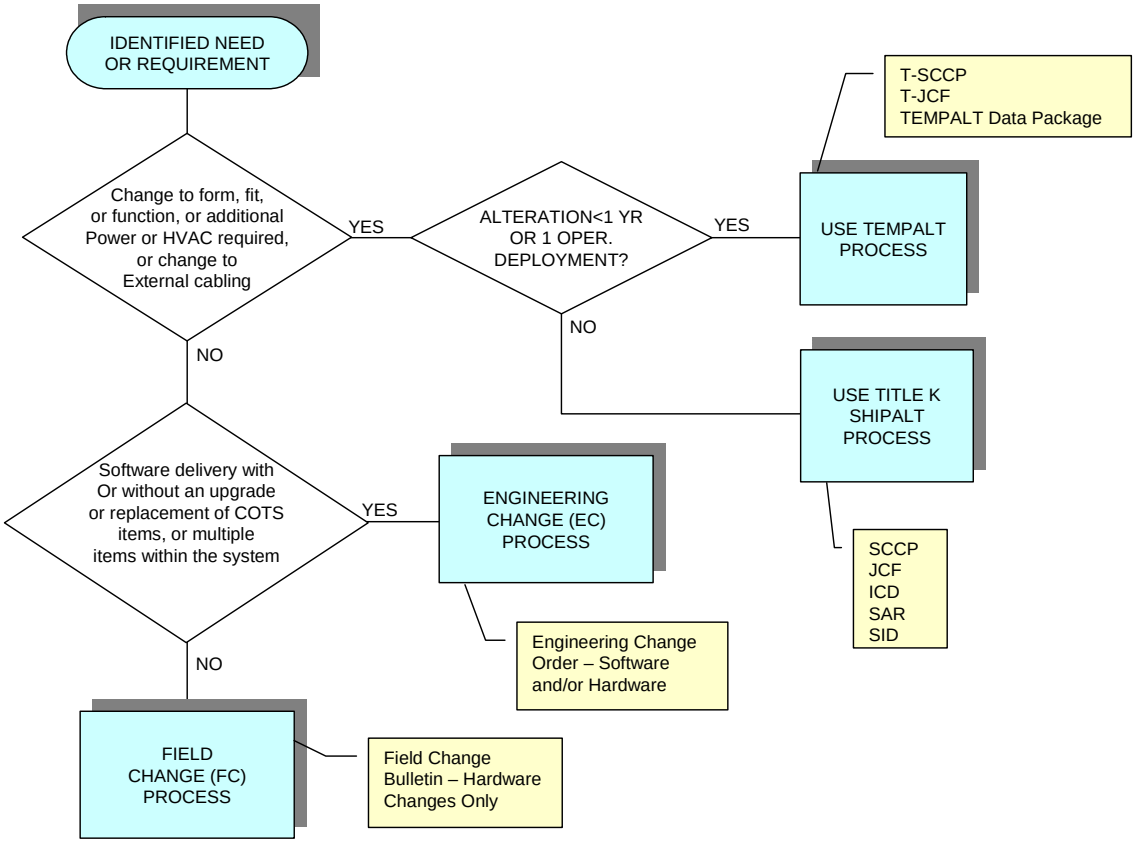


Figure 8. Initial Identification of the Installation Change Process (From SPAWAR, 2004)

The focus for this research is to detail the various stakeholders and activities involved in TEMPALT development and NAVSEA approval from a SPAWAR program office (SPAWAR PMW) perspective, with assistance from the Design Support Center (SPAWAR 04R-3) and the Battle Force Manager (SPAWAR 04F). The discussion in the remainder of this chapter overviews standard practices and timelines associated with design, pre-planning, installation, and completion reporting phases for surface ship modifications. Chapter 4 discusses the actual process flow and lessons learned associated with TEMPALT approval for an OED SCI MLS ARCHITECTURE on LCC-19 (USS BLUE RIDGE).

B. STAKEHOLDER ROLES AND RESPONSIBILITIES

Specific roles and responsibilities associated with the primary stakeholders in the TEMPALT process are delineated in the FMP manual (NAVSEA 2002), Volume 1,

Subsection 9-10.7 (reference Appendix A) for sponsoring activity, SPM and TYCOM entities. A high-level overview of these responsibilities is offered below.

The SPAWAR sponsoring activity, the SPAWAR PMW along with assistance from the SPAWAR Battle Force Manager (SPAWAR 04F) and the SPAWAR Design Service Center (SPAWAR 04R-3) has responsibility for the activities associated with the planning and development of the items listed below (White, 2004).

a. Installation scheduling and verification of ship(s) availability

b. Non-Standard Install Offer Message

c. TEMPALT Change Control Proposal (TCCP)

d. Plan of Action and Milestones (POA&M).

e. TEMPALT Justification/Cost Form (TJCF)

f. Final TEMPALT Data Package (Detailed in Table 3)

g. Funding for TEMAPLT pre-installation, installation, operational and removal phases

The NAVSEA Ships Program Manager (SPM) is responsible for the review and approval for deliverables relative to the TJCF, POA&M, ILS Certification and the TEMPALT Data Package. The applicable Planning Yard supports the SPM in reviewing the TEMPALT Data Package installation drawings to assess impacts to the ships configuration.

The Fleet TYPE Commander (TYCOM) has responsibility for final review and authorization of the Non-Standard Install Offer Message and the TEMPALT Data Package forwarded from the SPM.

C. TEMPALT PHASES

A TEMPALT can be decomposed to four phases over its life cycle. The four primary activities are detailed in the remainder of this section for 1) alteration development, 2) installation planning, 3) installation completion, and 4) alteration removal (Logg, 2004).

1. TEMPALT Design Phase Activities

The design phase for a TEMPALT starts with an emergent requirement to field and demonstrate new capabilities in an operational shipboard environment and when successful concludes with a TYCOM authorization to begin installation activities. The activities are best illustrated in two phases. The first phase encompasses activities associated with ship selection and notification to the TYCOM for approval to proceed with TEMPALT development. The process flow for alteration authorization is shown in Figure 9. After TYCOM authorization is obtained, the second phase is an iterative process for detailed alteration disclosure between SPAWAR representatives and external approval entities. The process flow for the alteration approval is shown in Figure 10.

To assist with clarity, the activities shown in Figures 9 and 10 references SPAWAR processes with blue rectangular process symbols and external reviews with yellow diamond shaped process symbols.

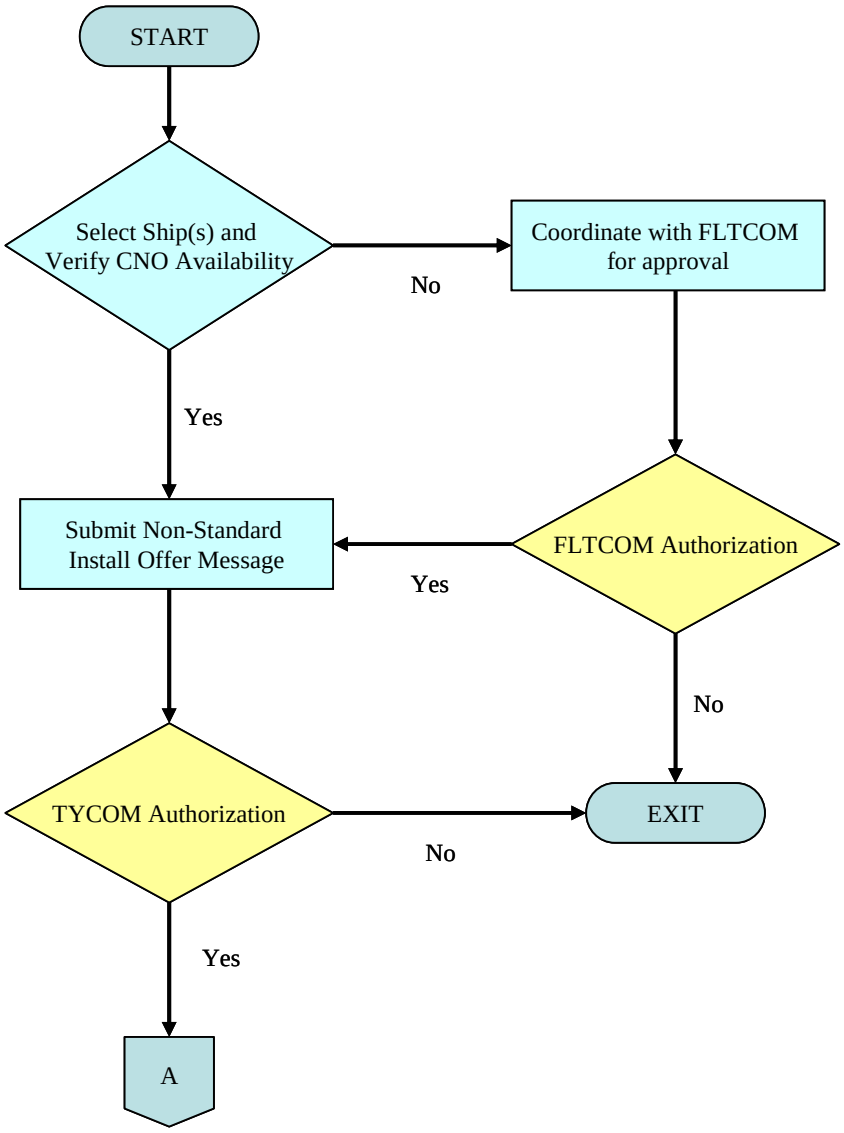


Figure 9. TYCOM Authorization for TEMPALT Development

The SPAWAR Program Manager, Warfare (PMW) program office (hereafter referred to as SPAWAR PMW) selects the platform(s) intended to receive the TEMPALT and verifies the ship's availability by working with the appropriate SPAWAR Battle Force Manager (BFM), or SPAWAR 04F. If the TEMPALT scheduling impacts Battle Force Interoperability (BFI) the SPAWAR BFM prepares documentation demonstrating that the alteration will not interfere with the BFI and prepares a submission to the Battle Force electronic Change Control Board (eCCB) to obtain Fleet Commander (FLTCOM) approval for the alteration (SPAWAR, 2004).

After availability is established, the SPAWAR PMW prepares and submits a Non-Standard Install Offer Message to the TYCOM for approval to proceed with TEMPALT development and ship check activities. The minimum timeline to obtain this approval is fourteen weeks prior to installation start to allow adequate time for the documentation reviews that follow.

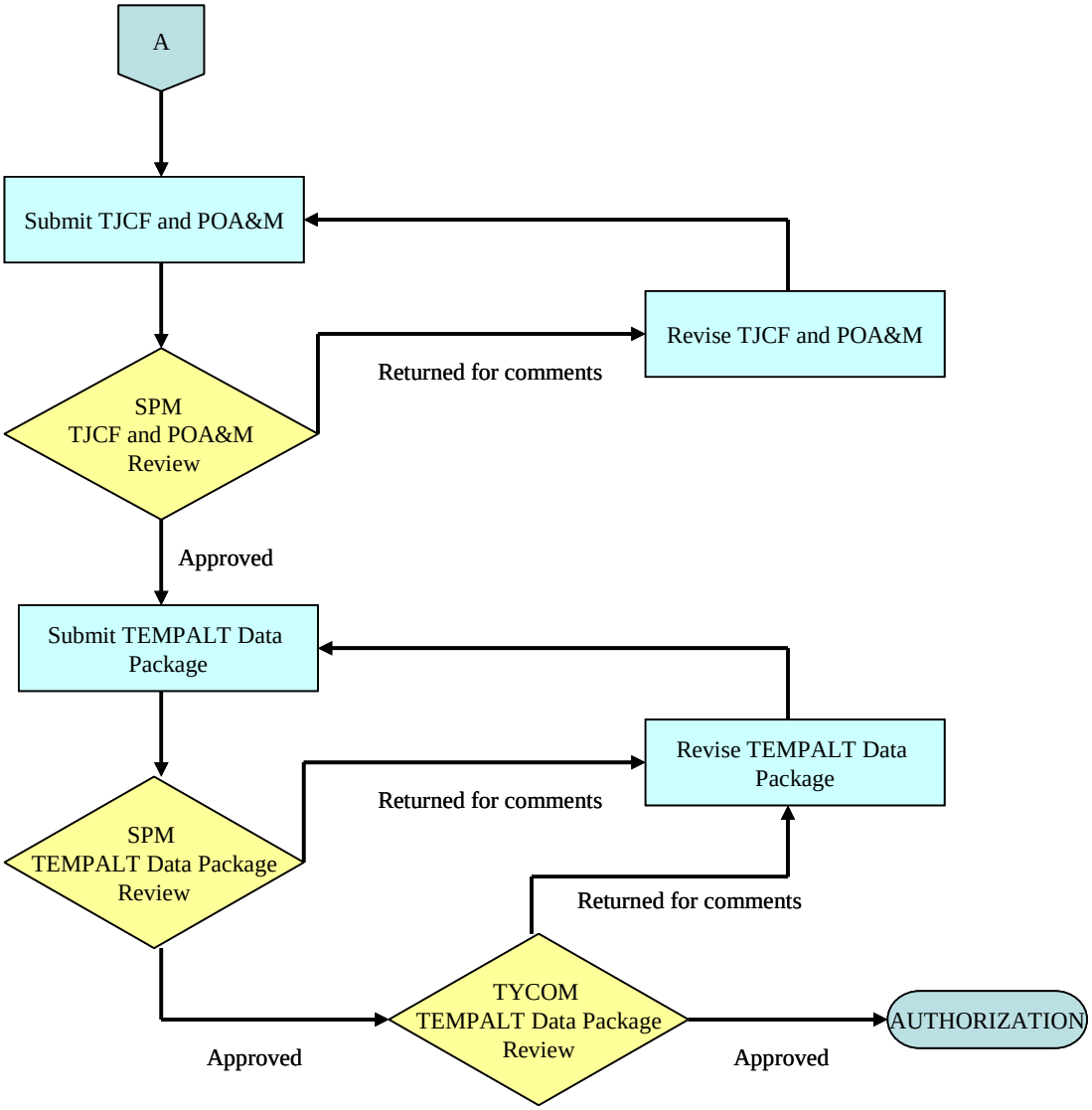


Figure 10. TYCOM Authorization for TEMPALT Installation

After authorization is received from the TYCOM the SPAWAR PMW commences to develop a TEMPALT Change Control Proposal (TCCP) to overview the impact to the ship in terms of the proposed alteration modifications and a Plan of Action and Milestones (POA&M) to document the proposed installation schedule. After these

documents are submitted the SPAWAR PMW starts to develop the TEMPALT Data Package.

The TEMPALT Justification/Cost Form (TJCF) is developed by SPAWAR 04R-3 from information provided in the TCCP for impacts to the ship and alteration costs. The draft TJCF is reviewed and signed by the SPAWAR PMW and then passed to the SPM for review and signoff. The SPM then assigns a TEMPALT Number to the alteration and inputs pertinent information from the TJCF into the Navy Data Environment - Navy Modernization (NDE-NM) database (Logg, 2004).

Development of the TEMPALT Data Package is carried out directly by the SPAWAR PMW or via tasking to design support agents at SPAWAR Systems Center Charleston (SPAWARSYSCEN-CHAS) and/or SPAWAR Systems Center San Diego (SPAWARSYSCEN-SD). The design agents schedule a ship check to support the proper development of installation drawings and when the drawings are completed they are submitted to the Planning Yard for review comments. These drawings detail system specific space adjustments, cable wiring and interfaces to other systems, and the electrical signal flow for each cable.

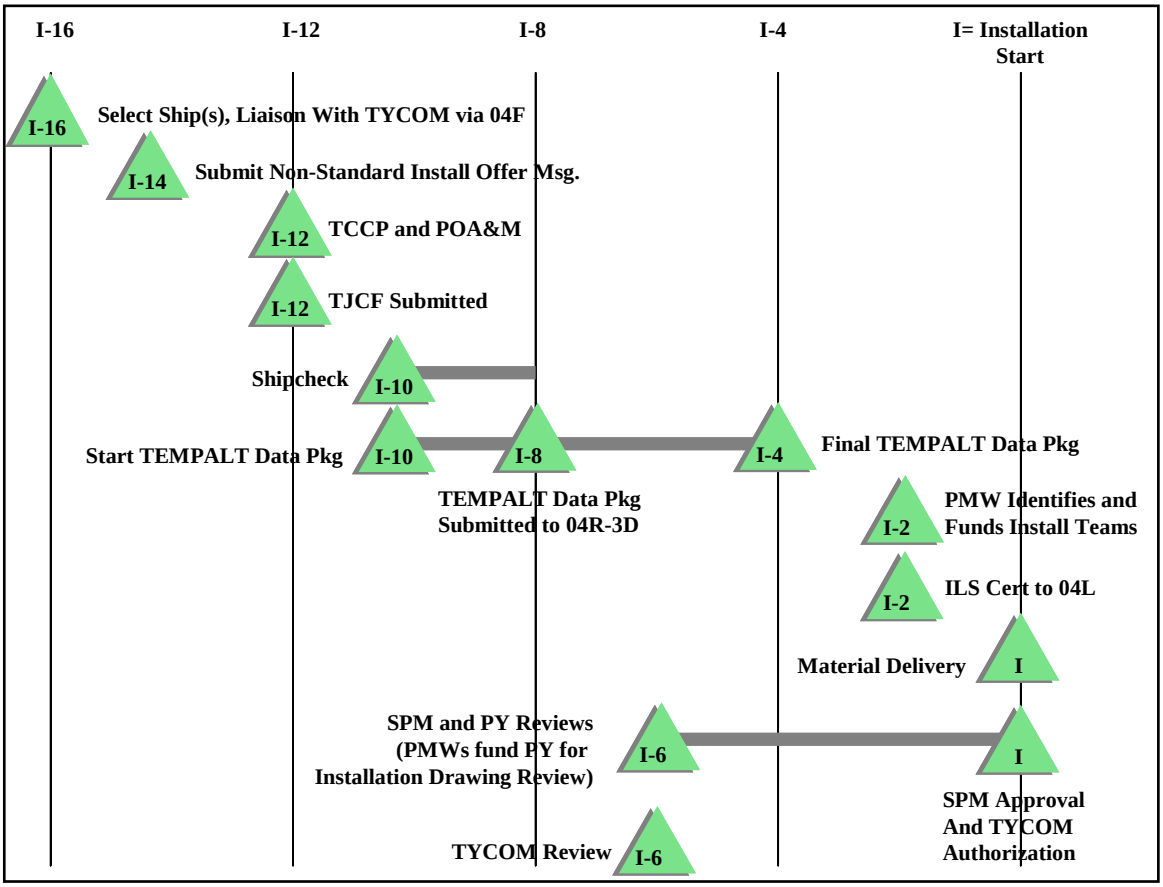
A Final TEMPALT Data Package submission is routed externally for review to the SPM and Planning Yard and revised as required. The SPM approved TEMPALT Data Package is then forwarded to the TYCOM for review and authorization for the installation. Upon receipt of TYCOM authorization, the SPAWAR PMW initiates tasking to the Installation Agent (IA) to perform pre-installation and installation activities.

Note: The SPAWAR PMW has responsibility for funding all activities associated with the TEMPALT design, pre-installation, installation, operational and removal phases.

a. Design Phase Timelines

SPAWAR 04R-3 recommends a minimum of sixteen weeks for TEMPALT Design Phase activities because adequate time is required to orchestrate the numerous and iterative activities within SPAWAR and externally to SPM and TYCOM organizations for their internal reviews and approval. Approval is typically granted via

each organization's Change Control Board (CCB) process. The recommended nominal timelines for each milestone are detailed below in Figure 11. The timeline shown is slightly revised from the original for omitting reviews specific to AEGIS surface combatants that are not applicable to Command Ships, and is revised from SPAWAR



04R-3's ship alteration guidance (SPAWAR, 2004).

Figure 11. Nominal TEMPALT Activity Timeline, Scale in Weeks (From SPAWAR, 2004)

b. TEMPALT Data Package Requirements

The TEMPALT Data Package is prepared by the SPAWAR PMW and includes the following information that is submitted to the Design Support Center (SPAWAR 04R-3) for review, approval and forwarding to the SPM.

Complete content requirements for SPAWAR developed TEMPALT Data Packages are detailed in the SPAWAR C4ISR Afloat Installation Design Toolbox

(Nowicki, 2002), for alterations that do not impact ships maneuverability, habitability, introduce safety issues, or have topside (antennae) modifications. A summary of the related documentation requirements is listed in Table 3.

TEMPALT Data Package
A description of the alteration (Alteration Brief)
Ship impact data Physical Arrangements Power Requirements System Interface Requirements Noise, Shock and Vibration (NSV) Analysis Heat Ventilation and Air Conditioning (HVAC) Requirements Signal Security (SIGSEC) Test for Electromagnetic Propagation and Evaluation for Secure Transmissions (TEMPEST)
Stress calculations
Weight and Moment calculations
Installation Drawings to include: Arrangement and Details Drawing (ship/system specific) Block Diagram (depicting each cable) (system specific) Cable Wiring Drawings (ship specific)
Integrated Lifecycle Support (ILS) documentation
Removal Exit Plan

Table 3. SPAWAR TEMPALT Data Package Requirements (From Nowicki, 2002)

2. TEMPALT Pre-Installation Phase Activities

The Pre-Installation Phase activity is performed by the SPAWAR PMW to; 1) task the Installation Activity (IA), 2) procure the installation equipment, and 3) to coordinate the installation schedule and impacts to the ship via in-briefs to the appropriate TYCOM and Battle Group stakeholders. The SPAWAR PMW is also responsible for delivery of the SPM approved TEMPALT Data Package and ILS certification to the designated waterfront activity, Regional Maintenance and Modernization Control Office (RMMCO), to obtain permission for ship access and support (Nowicki, 2004).

3. TEMPALT Installation Phase Activities

The Installation phase primarily involves the Installation Activity (IA) and the Installation Management Office (IMO), with managerial oversight from the SPAWAR PMW. The Installation Activity and IMO perform the following activity steps (SPAWAR, 2004):

a. Arrange for the Ship's Force training

b. Coordinate installation check-in with the RMMCO

c. Perform the installation

d. Verify the installation by performing the Ship Operational Verification Test (SOVT)

e. Coordinate the installation check-out with the RMMCO

f. Update the SPAWAR Integrated Data Environment Repository (SPIDER) database

g. Submit red-lined documents for the alteration changes

h. The SPAWAR PMW is responsible for the following activity steps:

i. Produce the SOVT Plan and Procedures

j. Monitor the installation and respond to any technical questions

k. Provide the ILS products

l. Report installation completion to the SPAWAR 04R-3 Design Center

This phase concludes officially when the Commander of the ship sends a Naval Message to the TYCOM and SPM that the installation has been completed.

4. Post-Installation Completion Reporting Phase

The final phase of the TEMPALT lifecycle is a Completion Reporting phase for TEMPALT removal. This phase has two primary steps for the SPAWAR PMW (Logg, 2004):

a. Initiate tasking to remove the TEMPALT and return the ship to the original configuration.

b. Report the removal to the appropriate SPAWAR 04R-3 Class Desk Manager and SPAWAR 04F Battle Force Manager.

This concludes discussion of the phases and activities associated with the formal TEMPALT process. Although it is a very detailed and sometimes tedious, process, it is critical to ensuring the installations on board Navy ships do not hinder the Warfighters' ability to carry out their mission. The days of contractors coming on board a ship and loading a system here and another system there are over. Those practices resulted in systems interfering with each others' functions, redundancy in hardware, and system administration nightmares. This formalized approach attempts to eliminate those issues and the process works well in achieving that goal. However, there are issues that the installer must be aware of prior to installing a system afloat and the installation of OED on board the LCC-19 provided an outstanding opportunity to explore those issues. The system had never been formally installed on board a ship so the OED installation team had never worked through the afloat installation process. Their effort to learn and follow the process provided lessons learned to share with future installers.

IV. USS BLUE RIDGE TEMPORARY ALTERATION

A. ALTERATION INTRODUCTION

Now that the requirements have been validated and assessed and the engineering solution has been reached, the next step in the installation is the documentation of a temporary alteration or TEMPALT. Previously, a thorough engineering review of the requirements determined an alteration to the current ship's architecture to introduce the OED CDS capabilities greatly improves the afloat Coalition mission by supporting continuous access to four simultaneous enclaves while eliminating network and hardware reconfiguration requirements in support of non-US (Coalition) stakeholders. This chapter illuminates the step-by-step process of documenting and approving the TEMPALT to support the engineering decisions. This TEMPALT (named the OED SCI MLS Force Level Architecture TEMPALT) provides a significant alteration: a large number of server processors, client workstations and interface equipment in the relatively small and constrained SCI spaces.

B. TEMPALT ARCHITECTURE REQUIREMENTS

Mr. Steve Brenneman (SPAWARSYSCEN-SD), the OED Chief Engineer, and Mr. Eugene Kwiatkowski (AMSEC), Lead Systems Architect for GCCS-M afloat variants, collaborated over several email exchanges to develop the unique USS Blue Ridge TEMPALT architecture shown in Figure 12 (Brenneman & Kwiatkowski, 2003). This afloat architecture is supported by three UNIX servers, four UNIX workstations, three PC servers, seven routers, a RAID array, network interfaces to four enclaves and various serial data interfaces.

The proposed architecture's hardware and interface requirements for system devices 1-9 in the below paragraphs (with manufacture and part number in parenthesis) are described from interviews with Mr. Richard Chavez, OED Senior Systems Engineer (Chavez, 2004).

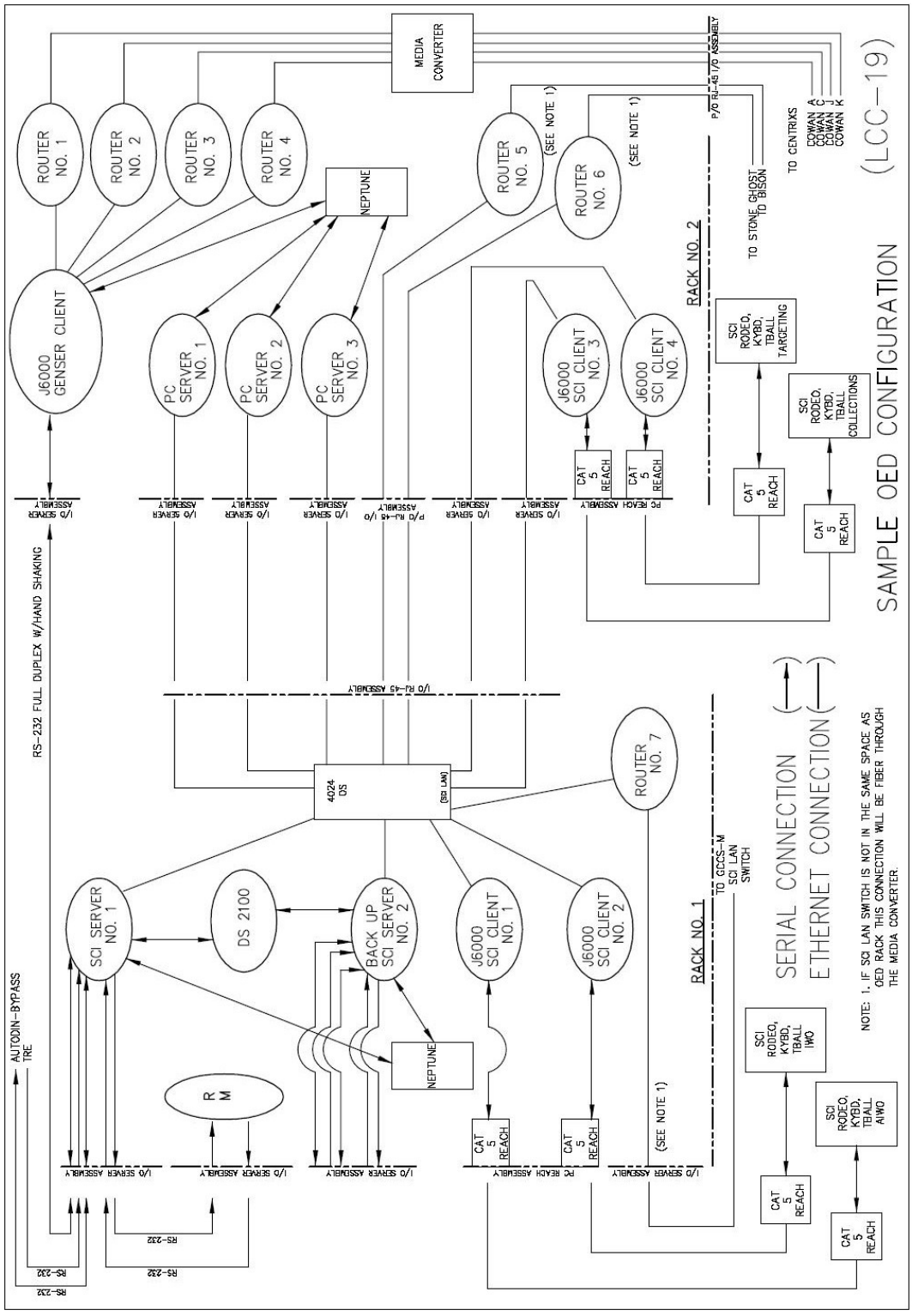


Figure 12. OED CDS Architecture and Signal Flow (From Brenneman & Kwiatkowski, 2003)

1. OED SCI Server No. 1 (HP J6000)

OED SCI Server No. 1 is the primary server in the architecture and is characterized as follows:

a. OED SCI Server No. 1 interfaced to external storage disks (DS2100) and to four distinct intelligence networks at different security domains. The server supports track correlation, communications management (provides for management of all the communications interfaces), databases, message archive, and other functions that the OED operators will utilize.

b. The GENSER serial signals TRE, GENSER GCCS-M, OTCIXS, RCV GCCS-M RM are supplied to the GENSER Communications Multiplexer which provides the path for message traffic to the OED SCI Server No. 1 and to the OED Coalition Server.

c. GCCS-M serial SIPRNET connectivity is provided by the Radiant Mercury (RM) track sanitizer (SUN Ultra 5 Workstation).

d. The SCI Gale and SCI GCCS-M serial interface with Radiant Mercury (RM) allows for sanitized tracks to be processed via a single OED Coalition Server to any/all of the Coalition users and to the SCI components (JWICS, BISON, and STONEGHOST) via SCI OED Server No. 1.

e. The program office is pursuing the accreditation of serial SIPRNET network connectivity while connected to STONEGHOST and JWICS. Approval is estimated for February 2005 (Fish, R., personal communication, August 19, 2004).

2. OED SCI Server No. 2 (Back Up Server)

OED SCI Server No. 2 (Back Up Server) provides redundancy for OED SCI Server No. 1 (Primary Server) and is only used for emergency purposes. During normal operations the backup server is turned off as a ready spare. Network connections, serial

interfaces and the external disk storage system are manually relocated to the backup server if a failure should occur to the primary server. The backup unit is then brought on-line to replace the primary.

a. Both servers are interfaced to the SCI Network Switch at 100Mbps. Three additional external network connections to STONEGHOST, BISON and JWICS routers No. 5, 6 and 7 are supported at 100Mbps.

3. Disk Storage System (DS2100)

The DS2100 is a rack mounted disk storage system that provides three additional 73 GB hard drives for data storage and backups. This system was used instead of a typical OED ashore system's larger RAID device due to shelf space constraints for the technically refreshed GCCS-M equipment racks.

4. OED Coalition Server (HP J6000)

A future OED Coalition Server will be interfaced to routers No. 1 thru No. 4. Those routers then interface to separate Coalition WANs (COWANs) for COWAN A (AUSCANUKUS), COWAN C, COWAN J (JMSDF) and COWAN K (Korea) provided by an external SPAWAR program (CENTRIXS Block 2) alteration.

The Coalition Server and the interfaces to the various COWANs were not activated on USS Blue Ridge because each interface because of concerns raised by the Type Commander; Commander, Pacific Fleet (CPF) (Stevenson, R., personal communication, June 30, 2003); that accrediting these interfaces could jeopardize the CENTRIXS Block 2 accreditation. Although it was later determined that the accreditation volumes for each system were independent, the network connections from CENTRIXS Block 2 were never interfaced with OED (Brenneman, S., personal communication, July 18, 2003).

5. SCI PC Servers (Vision V133-1126)

The PC servers run MetaFrame Proxy and PC client applications. BISON, STONEGHOST and JWICS PC servers are shown connected to independent routers No. 5, 6 and 7 and to the OED SCI Server No. 1 which provides crossover connectivity

between the systems OED Coalition units and SCI clients. PC servers rely on existing SCI LAN infrastructure for mail servers, DNS servers, etc.

The STONEGHOST and JWICS connections are accredited, but the BISON PC Server will remain inactivated until it gets accredited (Fish, R., personal communication, August 19, 2004).

6. System Management Consoles (SAIC Neptune)

Two rack-mounted work centers, one per equipment rack, provide for system administration for up to eight UNIX and PC servers. Each work center provides the ability to utilize a KVM switch to a single keyboard, trackball and display to multiple servers, thus minimizing hardware peripheral duplication.

7. UNIX Workstations (HP J6000)

There are four UNIX client workstations that run an ICA client to allow the user to display and run PC applications running in different security domains from a single workstation along with the local HP UNIX applications. The workstations provide for message parsing, correlation, message archive search functions, and similar services that are run on the OED SCI Server. All of the clients are used for situational awareness display, SCI/Special Access Program (SAP, a more restrictive security domain inside the SCI security domain) track management, message archive searching, message queuing/profiling, intelligence product generation (mostly intelligence messages), and other client functions. All of the clients have an identical OED software load on them and are named differently for the type of operator that was using that client.

The different UNIX workstation positions are referenced as; Collections Client Workstation, IWO Client Workstation, AIWO Client Workstation and Targeting Client Workstation.

Each rack-mounted client's video, keyboard and trackball interfaces are extended (via CAT-5 transmitters and receivers to distant desktop locations to provide for a smaller desktop footprint. Therefore, each operator seat is comprised of a keyboard, trackball and 18" (NEC 1850X) flat panel display. The UNIX workstations are interfaced to the SCI Network Switch at 100Mbps.

8. Radiant Mercury Sanitizer

Radiant Mercury (RM) provides sanitization for downgrading tracks to the multiple OED serial communications interfaces. The OED implementation of RM is in addition to a GCCS-M RM installation that sanitizes tracks and imagery between SCI and GENSER communications processors. The OED RM is configured with a rule set specifically for the OED multi-level requirements (Fish, R., personal communication, August 30, 2004).

9. SCI Network Switch (ALCATEL Omni Switch 4024)

The additional SCI network interfaces were provided by a 24 port workgroup switch. Media converters were installed to allow connectivity to the appropriate routers and switches to achieve TEMPEST requirements and security accreditation requirements.

C. TEMPALT SOLUTION

This section will discuss the OED system requirements and the associated challenges for such a large implementation in a space constrained shipboard environment.

1. Shipboard Equipment Racks

The purpose of an equipment rack is to consolidate equipment vertically in constrained shipboard spaces while protecting equipment in its payload area from harsh naval environments. The payload area for an equipment rack is characterized in terms of available rack units (RUs), where a rack unit measures 1.75” vertically.

Equipment racks are secured on board ships with a steel foundation mount assemblies and bulkhead mount assemblies. These assemblies incorporate steel rope coils to isolate the cabinet and its payload from the effects of vibration and shock, typical in naval environments. The cabinets also include fan assemblies that force cool filtered air into the bottom and throughout the payload area and to exhaust heat that is radiated from the payload contents. The filters cleanse the air of harmful particles such as dust, sand, lent and dander.

Equipment racks also provide panels for external interfaces for input power, communications data, and the network. Power anomalies are a fact of life on a Navy vessels (even on a nuclear carrier) and electrical equipment are subject to spikes, surges

and outages as electrical grids are adjusted. A Universal Power Supply (UPS) assembly interfaces to a 20 AMP service feed to provide protection for all cabinet subassemblies. The UPS is in turn interfaced to a Power Distribution Assembly (PDA) that provides power distribution to eight circuits and allows for selective shutdown of cabinet's subassemblies.

The installation of an equipment rack is a major undertaking for a SHIPALT or a TEMPALT. Passageways are not adequate to land bulky cabinets into an equipment room or operator space, so an alteration installation team (AIT) will have to orchestrate the more complicated tasks associated with opening bulkheads and using hoisting cranes to land a rack onto a ship. Additionally, the installation activity costs increase for the supporting shipyard riggers and welders.

The OED program is a member of the GCCS-M family of systems. To conserve installation costs and time, an SSC-SD ship check team in coordination with the ship's SCI enclave stakeholders, determined that there was an opportunity to technically refresh two underutilized 55" GCCS-M equipment racks. A drawing for the legacy racks is shown in Figure 13 (Brenneman & Kwiatkowski, 2003). Development of the USS Blue Ridge OED TEMPALT data package proceeded to document the landing of core OED system components in the Fleet Intelligence Center (FIC) space, third deck, frame 3-67-0-Q.

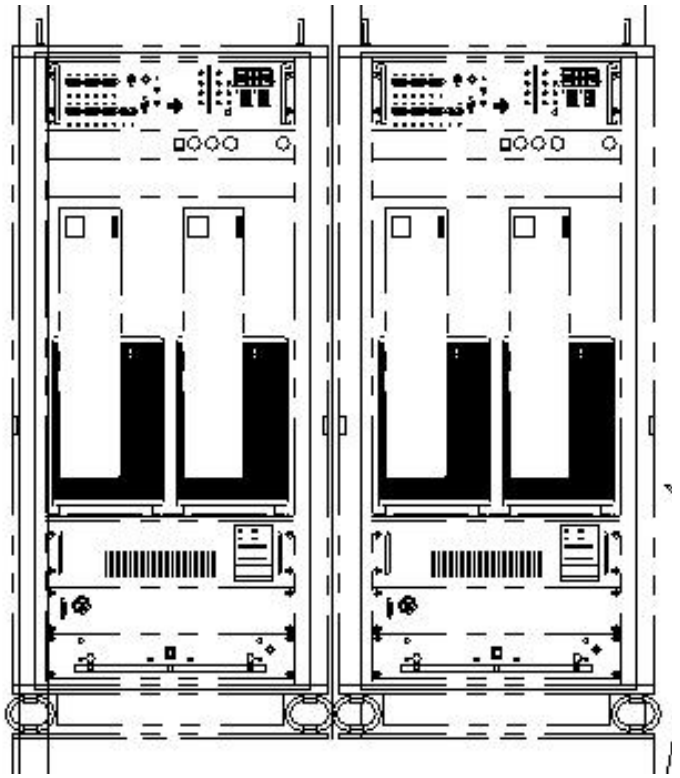


Figure 13. Legacy GCCS-M Equipment Racks (From Brenneman & Kwiatkowski, 2003)

Each GCCS-M equipment rack contained two older technology HP processors (circa 1995) that were mounted vertically, consuming the majority of the rack's payload area. The racks also had dated UPS assemblies, PDAs and suspect fan assemblies. The refreshment plan was to overhaul each rack completely and to refresh the power and fan subsystems with smaller and advanced solutions that contribute to increased rack units in the payload area. The large processors, PDAs and older UPS assemblies would therefore be removed leaving a bare cabinet assembly on coils to support the TEMPALT upgrades.

The OED SCI MSL Architecture Force Level suite of equipment consists of the two technically refreshed racks depicted in Figure 14 (Brenneman & Kwiatkowski,

2003), referenced for the remainder of this chapter as Rack No. 1 on the left side and Rack No. 2 on the right.

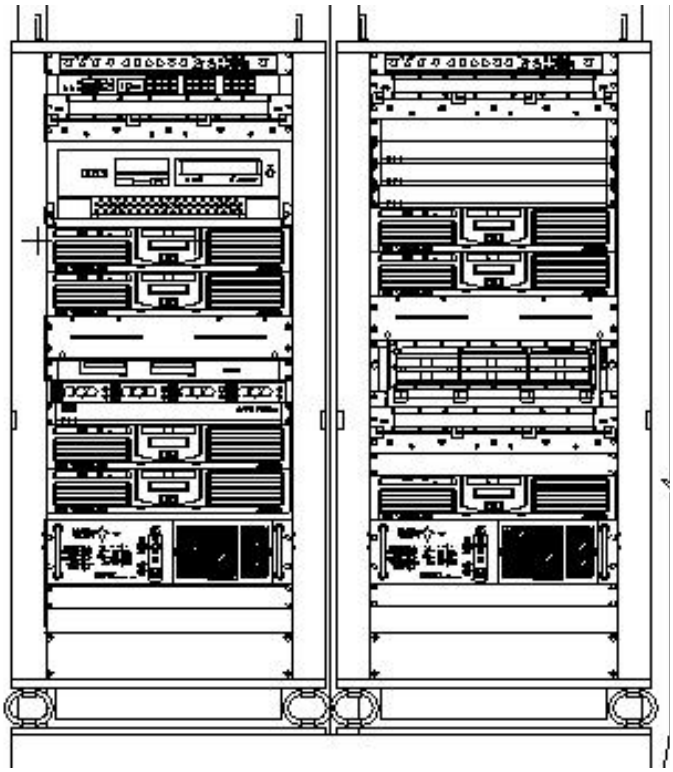


Figure 14. TEMPALT Adjusted Racks (From Brenneman & Kwiatkowski, 2003)

The following components were added to Rack No. 1 (in top-down order):

- 1RU PDA, 8 circuit (SAIC 112-32500)
- 24 Port Workgroup Switch (OS 4024)
- Media Converter, 8 port (MILAN 9100X)
- Sun Rave Radiant Mercury (RM2DIA-AX1105)
- SCI Server No.1 (HP J6000)
- SCI Server No.2 (HP J6000)
- Neptune Workstation Center (SAIC 136-32000)
- SCSI Expansion Chassis (SAIC 168-32000)
- Disk Storage System (DS2100)
- Router (CISCO 2621)

- Coalition Server (HP J6000)
- IWO Client Workstation (HP J6000)
- 2.4 KVA UPS (Clary UPS1-2.4K-1G-SRNDTI-J3)

The following components were added to Rack No. 2 (in top-down order):

- 1RU PDA, 8 circuit (SAIC 112-32500)
- Router (CISCO 2621), quantity 2
- Stoneghost PC Server (Vision V133-1126)
- Bison PC Server (Vision V133-1126)
- JWICS PC Server (Vision V133-1126)
- AIWO Client Workstation (HP J6000)
- Targeting Client Workstation (HP J6000)
- Neptune Workstation Center (SAIC 136-32000)
- Router (CISCO 2621), quantity 4
- Media Converter, 8 port (MILAN 9100X)
- Collections Client Workstation (HP J6000)
- 2.4 KVA UPS (Clary UPS1-2.4K-1G-SRNDTI-J3)

The peripheral components for the data package included the mounting of seven PC clients along and four remote operator positions that include an 18" flat panel display, keyboard and trackball over CAT-5 extenders from the racked Client Workstations.

2. Milestones during TEMPALT Development and Installation

This section highlights milestones or products that were delivered for the design, pre-installation, installation and completion phases associated with the OED SCI MLS Architecture TEMPALT on USS Blue Ridge (LCC-19). The key activities for each phase and the responsible stakeholder for the TEMPALT are listed in Table 3.

Activity	**Phase**	**Primary Stakeholders**
Schedule Installation, Select Ship(s) and Verify Availability	Design	PMW-157, SPAWAR 04F
Identify and Fund the Installation Team	Design	PMW-157
Prepare TCCP and POA&M	Design	SPAWARSYSCEN 24221

Produce Temporary Justification Cost Form (TJCF)	Design	SPAWARSYSCEN 24221, SPAWAR 04R-3
Initiate Integrated Logistics Support (ILS) Product Development	Design	PMW-157L
Produce TEMPALT Data Package	Design	SPAWARSYSCEN 24221
Complete TEMAPALT Data Package Review	Design	SPM, Planning Yard, TYCOM
Pre-Installation Activity	Pre-Installation	SPAWARSYSCEN, Code 24224
Installation Activity	Installation	SPAWARSYSCEN, Code 24224
Post-Installation Activity	Post-Installation	Performing Activity (TBD)

Table 4. OED TEMPALT Process Activities

The following notes are specific to the OED SCI MLS Architecture TEMPALT (White, 2004):

1. The NAVSEA Ships Program Manager (SPM) was Sherrie Johnson, PMS 470 (Command Ships). Shortly after the TEMPALT approval PMS-470 merged with PMS-400 (Surface Combatants) to become PEO-Ships. PEO-Ships is the SPM for all surface ships except for Carriers (PEO-Carriers) and Submarines (PEO-Submarines).

2. The applicable TYPE Commander (TYCOM) for USS Blue Ridge (LCC-19) is COMNAVSURFPAC. The point of contact for review and authorization of the TEMPALT was Many Panis, CNSP N603C.

3. The SPAWAR 04F Command Ship Battle Force Manager (BFM) during the time when the OED TEMPALT was processed was L.T. Clay Glasheen. Note: L.T. Clay Glasheen has since moved on and has been replaced with L.T. Tanya Wallace.

4. The SPAWAR 04R-3 point of contact is Bob Buckley, Director, SPAWAR Design Support Center, Head, C4ISR Implementation Design

& Support Division, SPAWAR Fleet Modernization Program Policy Coordinator.

5. The Boston Planning yard representative for LSD, LPD, AGF and LCC classes is Kelly Bailey, an On-Site Engineer at SPAWAR headquarters.

6. The PMW-157 OED Program Manager is Christopher Newcomb.

7. The logistics lead for Integrated Logistics Support (ILS) certification is Timothy Green, PMW-157L.

8. TEMPALT design and documentation development was lead by John Falbo, SPAWAR Systems Center (SPAWARSYSCEN), San Diego, Code 24221.

9. The lead performer for the pre-installation and installation activities was Mark Gabriels, SPAWAR Systems Center (SPAWARSYSCEN), San Diego, Code 24224.

3. Design Phase Products and Milestones

This section discusses the design phase products and timelines supporting the development through authorization milestones specifically associated with the OED SCI MLS Architecture TEMPALT.

a. TYCOM Authorization - The OED SCI MLS Architecture TEMPALT on the USS Blue Ridge (LCC-19) was considered after close coordination between OED program office, COMPACFLT and COMSEVENTHFLT (USS Blue Ridge) stakeholders. The alteration was requested by COMSEVENTHFLT via Navy Message (DTG: 040415ZAPRIL 03) and endorsed by COMPACFLT (DTG: 142341Z MAY 03). Note: The USS Blue Ridge was listed in a CNO Ships Restricted Availability (SRA) for the period of 29 May through 30 July, 2003.

b. TCCP, POAM and TJCF - PMW-157 developed a TEMPALT Change Control Proposal (TCCP) that included a Plan of Action and

Milestones (POA&M) after receipt of the COMSEVENTHFLT alteration request. This information is later included as supporting attachments to the more detailed alteration disclosure known as the TEMPALT data package. The TEMPALT Justification/Cost Form (TJCF) was developed by SPAWAR 04R-3 from information provided in the TCCP. The draft TJCF was reviewed and signed by SPAWAR 04R-3 and PMW-157 and then submitted to the SPM for review and signoff approximately 14 May, 2003. The TEMPALT was referenced internally to corporate SPAWAR as "TA134".

c. Ship Check - SPAWAR PMW-157 considered TEMPALT accomplishment to be within the capability of an Alteration Installation Team (AIT). The San Diego based team was selected due to their familiarity with earlier GENSER and SCI GCCS-M installations supporting the USS Blue Ridge (LCC-19). The ship check was consolidated with a SCI GCCS-M software upgrade for the time period of 03/01/03 through 03/05/03.

d. TEMPALT Data Package – The OED SCI MLS Architecture TEMPALT Data Package and supporting attachments for alteration drawings and ILS certification was submitted to the SPM and PY on 05 June, 2003 (Reference Appendix B). These attachments are included as additional appendices in this document for review purposes.

    i. TEMPALT Arrangement Drawing (Reference Appendix C)

    ii. TEMPALT Cable Block Diagram (Reference Appendix D)

    iii. TEMPALT ILS Certification (Reference Appendix E)

e. ILS Products – ILS certification submission to the SPM was provided on 10 June, 2003.

f. The SPM assigns a NAVSEA TEMPALT number and inputs the information into the Navy Data Environment - Navy Modernization (NDE-NM) database and the OED SCI MLS Architecture TEMPALT is referenced in the database as TA1517 on 11 June, 2003.

g. TYCOM (COMNAVSURFPAC) authorization of TEMPALT Data Package (Reference: DTG 111812ZJUN03)

4. Pre-Installation Phase products and Milestones

The Pre-Installation Phase activity provides the coordination and preparation for the alteration installation. This activity consists of the following steps to be performed by SPAWAR PMW-157:

a. Complete procurement activities and prepare shipments to support the alteration requirements prior to the estimated start date of 09 June, 2003.

b. Coordinate the alteration with the SPM, TYCOM, Fleet Stakeholders with in-briefs scheduled for 30 June, 2003. Normally this would be done ahead of the install window, but since this alteration was in Japan the in-brief was accomplished the first day of the three week installation window (30 June through 21 July, 2003).

c. Obtain SPM approved copies of the TEMPALT Data Package with ILS certification for RMMCO check-in on 30 June, 2003.

5. Installation Phase Products and Milestones

The Installation Activity involves primarily the Installation Activity and the Installation Management Office (IMO), with monitoring and tasking support from SPAWAR PMW-157.

a. The Installation Activity and IMO perform the following activity steps:

b. Coordinate installation check-in with RMMCO on 01 July, 2003.

c. Perform installation and on-the-job training from 02 July through 20 July, 2003.

d. Verify the new system installation by completing the Ship Operational Verification Test (SOVT) on 20 July, 2003.

e. Coordinate the installation check-out with RMMCO on 20 July, 2003.

f. Update the SPAWAR Integrated Data Environment Repository (SPIDER) database (approximately 21 July, 2003).

g. Submit red-lined drawings to the Planning Yard for the alteration changes on 28 July, 2003.

SPAWAR PMW-157, the sponsoring activity, was responsible for the following activity steps:

a. Produce the SOVT Plan and Procedures prior to installation start.

b. Monitor the installation and respond to any technical questions.

c. Report Installation completion to the SPAWAR 04R-3 Design Center. Note: The Commander of the Ship will send a Naval Message to the TYCOM and SPM that the Installation has been completed.

6. Completion Reporting Phase Products and Milestones

A post completion decision to retain or remove the TEMPALT needs to be addressed before the alteration turns a year old, reference Figure 15. The TYCOM can consider options to:

a. Restore the ship to its original configuration

b. Extend the TEMPALT for specific term (typically a year)

c. Approve the alteration as a SHIPALT

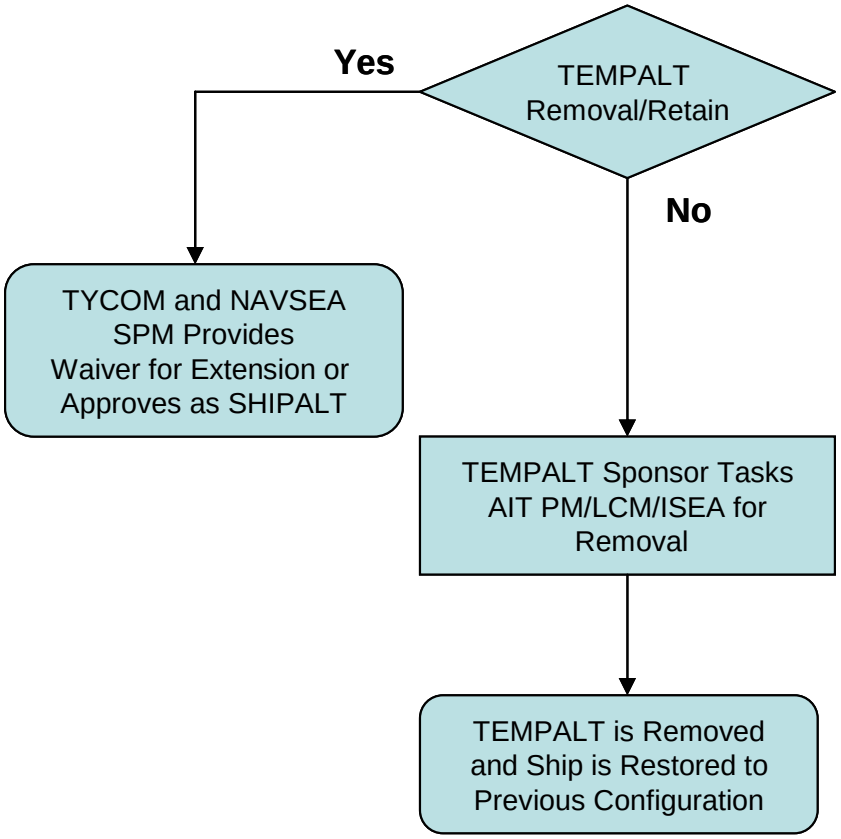


Figure 15. Remove/Extend/Convert TEMPALT

The present status of the OED SCI MLS Architecture TEMPALT on USS Blue Ridge is that it remains on board, while the ship is in the ship yard undergoing repairs, even though it should have been removed in July, 2004 per the removal plan. The OED program office is currently in collaboration with NETWARCOM requesting funding to support a second year's extension.

D. SUMMARY

This chapter overviewed the OED system requirements in terms of signal flow and the associated hardware components interfacing to multiple network domains and external systems. Space for equipment is very limited in ship spaces, and the TEMPALT authors coordinated with the fleet stakeholders to accommodate all the server and network components as a technical refreshment of two 55" legacy SPAWAR PMW-157

program equipment racks. Operator positions were also technically refreshed with rugged UNIX and PC workstations with flat panel displays.

Many lessons were learned by OED representatives during the process detailed above. These observations will be summarized in Chapter 5 with a checklist to aid the installation teams of the future. In addition to Chapter 5's valuable information, the documentation developed by the OED program office with the assistance from the Installation Group (SPAWAR 04R-3) during this process have been included in the appendices to this paper.

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V. LESSONS LEARNED

A. SHIPBOARD INSTALLATION OF COTS EQUIPMENT

The previous three chapters provided a narrative of the afloat installation process by describing the requirements process, the engineering analysis and solution for the requirements, and the installation policies and procedures required to field the engineering solution afloat. The earlier chapters not only described the process but provided in-depth insight into an afloat installation by identifying lessons learned and best practices found by the OED installation team. These best practices and lessons learned will be the focus of this chapter.

The Navy has introduced efficiency and cost savings with the use of COTS equipment afloat. However, there are critical considerations to take into account when using COTS as the OED installation team discovered. The shipboard implementation of each COTS component required that the OED program office procure specially designed kits for the UNIX and PC servers to technically refresh the legacy GCCS-M equipment racks. The kits included a hinged face plate, heavy duty slide rails and a cable harnesses tie wrapped to a swing arm that provided support for each processor's power and communications requirements. Additional rack assemblies included rack mounted KVM displays, UPS assemblies, fan assemblies, power distribution assemblies and a prototype mounting shelf for the numerous routers and related rear I/O panel network interface requirements.

Client positions provide analysis tools and decision aid support and are designed similarly to survive the harsh naval environmental forces for shock and vibration. These workstations were either kitted up and collocated with the servers in the equipment racks or secured locally to an operator's desk. Each flat panel display was enveloped in metal in a metal frame which was secured to the operator's desktop with bolts.

B. SPAWAR PROGRAM TEMPALT CHECKLIST

This research provides a checklist to assist other SPAWAR program offices in understanding the numerous TEMPALT products and the milestones accomplished for

the design, pre-installation, installation and post-installation phases. A SPAWAR program TEMPALT checklist is provided in Table 4.

	SPAWAR PROGRAM TEMPALT CHECKLIST
	1.A. Initiate Planning and Coordination:
	Ensure command support and concurrence with installation plan
	Prepare TCCP and draft POA&M
	Submit TCCP and POA&M to SPAWAR 04R-3
	SPAWAR 04R-3 Assigns TEMPALT# and creates entry into SPIDER
	1.B. Obtain Authorization:
	Select Ship(s) and Verify CNO Availability
	Submit Non-Standard Install Offer Message to TYCOM. Submit to CINC for installs affecting BG Interoperability.
	Receive TYCOM and/or FLTCOOM authorization to perform installation
	Identify and receive funding necessary for installation
	Identify critical Points-of-Contact and introduce them to the effort
	Shipyard, SPAWAR on-site personnel, RMMCO, etc.
	1.C Develop Temporary Justification Cost Form and ILS Documentation:
	Prepare Temporary Justification Cost Form (TJCF) with SPAWAR 04R-3
	Initiate Integrated Logistics Support (ILS) Product Development
	SPAWAR 04R-3 submits TJCF to NAVSEA Ships Program Manager (SPM)
	Receive SPM review and approval for TJCF
	2.0 Ship Check:
	Request authorization to perform ship check from cognizant TYCOM
	Receive authorization to perform ship check from cognizant TYCOM
	Identify and fund the Installation Team
	Perform ship in-brief and ship check
	Develop ship specific drawings supporting the TEMPALT Data Package for electrical, mechanical and interface data
	3.0 TEMPALT Data Package
	3.A TEMPALT Data Package Development:
	Description of the Alteration (Alteration Brief)
	Plan of Action and Milestones (POA&M)
	Ship Impact Data
	Physical Arrangements
	Power Requirements
	System Interface Requirements
	Noise, Shock and Vibration (NSV) Analysis
	Heat Ventilation and Air Conditioning (HVAC) Requirements

	Signal Security (SIGSEC)
	Test for Electromagnetic Propagation and Evaluation for Secure Transmissions (TEMPEST)
	Stress Calculations
	Calculated Weight and Moments Record
	Ship-specific TEMPALT Installation Drawings
	Arrangement Drawings
	Cable Block Diagram
	Cable Wiring Drawings or Cable Running Sheets
	Integrated Logistics Support (ILS) Certification
	Removal/Exit plan established with funding identified
	Identify accreditation boundaries and
	Determine accreditation requirements for those boundaries
	3.B TEMPALT Data Package Approval
	Submit TEMPALT Data Package for SPM Review
	Receive SPM approval
	SPM submits the TEMPALT Data Package for TYCOM authorization
	Receive TYCOM authorization
	Submit TEMPALT Data Package and ILS Certification to the designated waterfront activity or Regional Maintenance and Modernization Control Office (RMMCO) as appropriate.
	Receive RMMCO approval to proceed with alteration
	4.0 Pre-Ship Installation Process
	Coordinate the TEMPALT pre-installation RMMCO as appropriate
	Procure all installation equipment
	Run initial lab tests on equipment upon receipt
	Pre-stage all equipment, run equipment tests again.
	Task and assign the Installation Activity
	Lead ship in brief
	5.0 Installation Process
	Start and complete the TEMPALT installation requirements
	Provide training support
	Perform certification testing to ensure completion
	Deliver ILS products
	Report installation completion to SPAWAR 04R-3
	Installation Completion Navy Message to TYCOM/FLTCINC
	6.0 Post Ship Install Process
	Carry out the removal exit plan to return the ship to its original configuration
	Completion Reporting to SPAWAR 04R-3, SPAWAR 04F, TYCOM and FLTCINC

Table 5. SPAWAR Program TEMPALT Checklist (From SPAWAR)

C. RECOMMENDED VERSUS ACTUAL TIMELINES FOR TEMPALT ACTIVITIES AND MILESTONES

The TEMPALT process is performed in the context of the NAVSEA Fleet Readiness Program (FRP) timeline (reference Figure 11). The FRP timeline establishes the need dates for the design artifacts required to support an installation. Figure 10 shows the first product (the TCCP and POA&M) must be delivered to SPAWAR 04R-3 twelve weeks prior to the installation date. Table 5 tabulates the information from the nominal timeline and matrixes TEMPALT products (gray rows) and activities (white rows) in activity or milestone order. The timeline column is scaled in weeks prior to the installation start date.

The purpose of this section is to compare recommended delivery dates for standard TEMPALT products and activities to the actual products and activities associated with the OED SCI MLS Architecture TEMPALT (TA1517). The column labeled Nominal Date is a converted calendar date from the installation target date of 09 June, 2003.

TEMPALT Activity or Milestone	Timeline (Weeks)	Nominal Date	Actual Date
Select Ship, Liaison with TYCOM via 04F	I-16	03 March	04 April
Submit Non-Standard Install Offer Message	I-14	17 March	14 May
TCCP and POA&M Submitted to 04-R3	I-12	31 March	08 May
TJCF Submitted to SPM	I-12	31 March	14 May
Ship Check start	I-10	14 April	03 March
TEMPALT Data Package Start	I-10	14 April	15 May
TEMPALT Data Package Submitted to 04-R3	I-8	28 April	02 June
Ship Check completed	I-8	28 April	07 March
TEMPALT Data Package Submitted to SPM	I-4	12 May	05 June
ILS Certification Submitted to SPM	I-2	26 May	10 June
SPM Approval	I	09 June	11 June
TYCOM Authorization	I	09 June	11 June
RMMCO Approval of TEMPALT Package	I		30 June
Installation Start	I		30 June

Table 6. OED TEMPALT Timelines for Activities and Products

Two general observations can be made from Table 5. First, the OED program office representatives initiated activities and the development of products approximately four to two weeks behind the recommended schedule. A compressed development and delivery schedule was accomplished with close teaming and coordination with both Battle Force Manager (SPAWAR 04F) and the Design Support Center (SPAWAR 04R-3) representatives. The POA&M installation target of 09 June was missed by three weeks because of additional activities required for RMMCO check-in and approval of the TEMPALT Data Package. This ultimately verifies the nominal schedule, where starting two to four weeks late and close attention of OED support members yielded a three week late installation start.

A secondary observation is for external reviewers and their processes. SPAWAR 04R-3 representatives work closely with external SPM and TYCOM recommendations and could request expedited review of the various deliverables. What caught most everyone by surprise was the addition process time afforded for obtaining the TYCOM approved TEMPALT Data Package and ILS Certification and checking these products in with RMMCO. RMMCO is the "gate keeper" at the waterfront, and you can't start installation activities without their concurrence. The primary lesson learned is the RMMCO check-in and approval process can take several weeks.

D. FLEET INPUTS

The one factor that kept this process going throughout the TEMPALT timeline listed in Table 5 was the Fleet's inputs. If the USS Blue Ridge or the Seventh Fleet staffs had not forcefully demanded the installation of OED on board LCC-19, the installation would have been delayed to the next availability (four to five months later) or cancelled entirely. The OED Program Office collected the Warfighters' concerns and requirements and used these to keep the process going when it seemed to be stopped. As evidenced in our actual versus recommended timeline numbers, the OED installation team was able to push thru documentation at a rate much faster than the recommended timeframe. The ability to compress the time requirements was fueled entirely by the Fleet's insistence that OED get installed in that availability.

E. ACTUAL VERSUS PLANNED SYSTEM IMPLEMENTATION

Although the original architecture was developed and proposed by a team of CDS and systems experts (the SPAWAR CDS IPT), the process of evolving from the best engineering solution to the Warfighters' requirements to the installed solution set is a tortuous road. The installation team must be ready to address sudden implementation changes (which is ironic when the actual process is very rigid) due numerous issues.

1. Chain of Command Issues

The proposed architecture relied heavily on OED to be the cornerstone of the Coalition architecture. The SPAWAR CDS IPT recognized the need to address all three states of data (at rest/storage, in transit, and in process) in the Coalition architecture in order to provide the Warfighter with the best solution to his Coalition requirements. For example, MLTC is a very good tool for eliminating multiple monitors/PCs on the Warfighter's desk but the Warfighter is forced to correlate the four or five windows on his MLTC monitor if the data provided is of any use to him. MLTC with an OED now provides a means to view different security domains with the correlation process occurring in the background on the OED server. Another example is CENTRIXS. Coalition networks are a very good means of transiting data between Coalition partners and US Warfighters. However, the network ends in a server with no means to transfer data between the networks and no value added by bringing in track data from other sources since the data can't be correlated with the larger set of data for that track. With CENTRIXS and OED, the data can be labeled with its origin (thus honoring bilateral agreements), utilized by the correlators to get the best picture (OED performs correlation on the entire set of data from SCI to Coalition while protecting the security levels of all the data), and the best COP can then be disseminated to everyone in the battle space with the correct associated data according to their clearances and bilateral agreements.

However, due to personalities, risk aversion, and other issues, the proposed architecture was not carried out in the installation of OED. Many of the communications channels were not interfaced and the GENSER Coalition OED was never implemented. It is critical that the Program Office ensure chain of command approval and backing prior to starting the installation process. Again, the Fleet's support in this matter will benefit the program's cause.

2. Security Accreditation Issues

Accreditation issues are always, always going to be critical to a successful installation. The OED program has been accredited over 48 times so the general feeling of the installation team was accreditation was the easy piece of the problem. Unfortunately, accreditation is never easy and the OED Program Office should have brought the accreditors into the process early. The actual OED system accreditation was rather straightforward (as expected). The accreditation issues arose when the accreditors looked at the OED interfaces with other programs. Although OED interfaces with many different networks, communication lines, and systems in its ashore installation, many personnel involved in the installation process for the entire Coalition architecture decided the risk of accrediting OED interfaces with GCCS-M (two-way) and CENTRIXS/MLTC architecture was too great. As it turned out, OED is accredited at all of its shore sites to interface with GCCS (either GCCS-M or the Joint GCCS). The other issue was the risk of CENTRIXS/MLTC accreditation failing due to the OED/CENTRIX accreditation if that should fail. After discussing the issue with all the accreditors involved, it was agreed that the accreditation boundaries for OED and CENTRIX/MLTC made their accreditations entirely independent of each other so if the interface accreditation failed, neither system's accreditation would be effected (Thomas, G., personal communication, June 30, 2003). However, the complete accreditation was never pursued.

3. Funding

Funding is always an issue that must be addressed early on and often throughout the process. The OED installation was so strongly supported by the Fleet up and down the chain of command that the installation was started without the funding in hand at the Program Office. Although it was in the "do what's best for the Fleet" spirit of the Program Office, the funding never came through and the program suffers to this day from that. Always ensure the funding is in place and the correct amount of funding in each acquisition funding type (for example, procurement, maintenance, operating, etc.)

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VI. CONCLUSION AND RECOMMENDATIONS

The afloat installation process is a very complex and lengthy process to follow but a very necessary process nonetheless. It is necessary due to the mission criticality of the IT equipment and software on board a US Naval warship. The days of fighting with iron canon balls and targeting by "eyeing it" are long gone and the slightest perturbation in the Warfighter's information systems architecture could affect the command and control mission, the targeting mission, the strike mission, and the force protection (self-defense) mission, to name a few. It is far too risky to simply install hardware and software on board a ship without rigid processes and tried practices.

The OED installation afloat provided a "clean slate" to learn the up's and down's of a rigid installation process. The team was new to afloat installations, the system had never been fully installed on board a ship, and the program office, along with other SPAWAR partners, worked through many issues and obstacles to achieve a successful installation. Is this the last installation afloat for any SPAWAR system? Definitely not, so the authors of this paper were determined to share the lessons learned of this experience so future installations can go more smoothly. It is better to benefit from lessons learned than to bog down on lessons re-learned the hard way.

The critical components of a successful installation are time, budget, and command support. With sufficient time, funding and support, any installation can be accomplished. In the OED installation, time was an issue because the installation started much later than it should have. Funding was an issue, not so much during the installation process but, more so, now during the life cycle maintenance of the system (which is part of the installation process, as is the disposal/removal step). Since OED is a woefully under funded program, funding problems arose during the installation, too, but those were not due to the installation process per se. Lastly, command support issues arose throughout the installation process. Most of those were addressed by the strong teaming of the OED installation team, the program office, the SPAWAR installation experts (Code 04), and the on-site SPAWAR detachment personnel. Of course, a lot of credit

goes to the Fleet personnel involved because the pressure they applied to resolving the issues definitely helped the team work them out in a timely fashion. However, some command support issues did not get worked out and the proposed OED installation came up short of everyone's expectations in regards to communications channels and SCI/GENSER services. Some of these shortfalls were based on concerns for the Warfighter's ability to utilize the systems and tools already on board and the risk (real or perceived) of setting up certain interfaces to those existing systems and tools.

Overall, the OED installation was a success and, via interviews with the team, researching the installation effort, and personal experience, the authors were able to dissect that success to document lessons learned and a comprehensive checklist for future installers to follow, modify, and add new lessons learned. As the installation policies and procedures provide the basic foundation for every installation, the comprehensive checklist provides the future installer with a tool to avoid pitfalls, identify issues, and successfully complete an installation in a timely manner. Of course, every installation is unique and this thesis provides the future installer with the insight and forethought to meet those unique concerns and problems early and resolve them correctly. It is the mission of every PEO and SPAWAR employee to provide the Warfighters with the tools they need to successfully carry out their missions. Every effort should be made to efficiently carry out the PEO/SPAWAR mission and this thesis, with its lessons learned, best practices, and comprehensive installation checklist, is a step forwards in improving the installation process.

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APPENDIX A: NAVSEA FLEET MODERNIZATION PROCESS, VOL 1, SECTION 9, SUBSECTION 9-10 TEMPORARY ALTERATIONS (TEMPALTS)

9-10. 1 Scope

This subsection outlines the policy, process and responsibilities for development and approval of TEMPALTs proposed for accomplishment on operational Fleet ships.

9-10.2 Exemptions

This subsection does not apply to the following:

- Submarines - TEMPALTs proposed for accomplishment on submarines or submersibles are covered by reference S9(z).
- Availability Testing - TEMPALTs performed as part of dry-dock or dockside testing during overhauls and other availabilities.
- Test Gauges - Temporary installation of mechanical gauges that connect to fittings designed and installed for test equipment attachment. The use of test gauge fittings for other than test equipment attachment will be approved by the SPM before usage.
- Temporary Equipment Alterations in the form of ORDALTs, MACHALTs, FCs AND ECs.

9-10.3 Definition

A TEMPALT is any alteration that provides new or improves existing capabilities on a temporary basis (not to exceed one year or one operational deployment in duration) in support of Research Development, Test and Evaluation (RDT&E) or military exercise or mission requirements. Budgeting and funding for TEMPALT accomplishment is usually part of the applicable project or program for RDT&E alterations, or the cognizant FLTCINC, TYCOM or CNO Resource Sponsor for mission support alterations. Budgeting for TEMPALTs shall include sufficient funding to remove the alteration and restore the ship to its original configuration. TEMPALTs are not funded as part of the FMP.

9-10.4 TEMPALT Categories

The following are the general TEMPALT categories:

- At-sea testing and evaluation, i.e., including sea trials, fast cruise, SONAR certification, and weapon or missile system certification trials
- Research and development
- Operational Evaluation/Technical Evaluation (OPEVAL/TECHEVAL)
- Special Mission/Battle Group
- Military Exercise or Contingency Operations
- CS PMIs and PSIs

9-10.5 Policy

TEMPALTs shall be reviewed and technically approved by the cognizant SPM before being authorized for accomplishment by the cognizant TYCOM. Alterations that are intended to be installed for a period in excess of one year or one operational deployment shall be considered a permanent change to a ship's configuration and shall be accomplished as a SHIPALT. After completion of testing requirements, mission or exercise support requirements or one year, whichever comes first, TEMPALTs must be removed and the ship restored to its previous configuration. The activity sponsoring the accomplishment of the TEMPALT shall be responsible for funding the removal of the TEMPALT and the restoration of the ship.

If the intent/functionality of a TEMPALT is accomplished by a follow-on SHIPALT, that TEMPALT will be cancelled and not authorized for further installations. TEMPALT installation drawings that are not developed by the PY shall be forwarded to the PY for review and approval.
TEMPALTs that may affect Battle Group Interoperability will be coordinated with the cognizant CINC /NAVSEA 53 prior to installation scheduling.

9-10.6 TEMPALT Process

TEMPALT planning, development and execution closely mirrors the process for permanent SHIPALTs. The sponsoring activity will submit a JCF to the cognizant SPM to obtain a TEMPALT number and concept approval. However, the JCF is not used to obtain funding. Funding associated with TEMPALTs will be borne by the sponsoring activity not the SPM.

TEMPALTs do not require the development of a formal document like the SAR, which is required for SHIPALTs. However, alteration design development for TEMPALTs is the same as for SHIPALTs. A Plan of Actions and Milestones (POA&M) will be developed by the sponsoring activity which outlines requirements for design shipcheck, design development, drawing approval, assembly fabrication, testing (e.g. land-based, pre-and-post installation, at-sea), alteration accomplishment and alteration approval. The POA&M should include all personnel associated with the TEMPALT during its entire installed timeframe, as well as the identification and mitigation of all topside impacts to the CS. The SPM, TYCOM and PY are required to review the POA&M and provide comments to the sponsoring activity. The SPM, TYCOM and PY will be provided copies of the final POA&M.

After the POA&M is issued, the sponsoring activity must coordinate detailed planning with the TYCOM and SPM to establish which ship is to receive the TEMPALT (if not previously identified in the tasking document) and to determine dates that the ship will be available for design shipcheck and alteration accomplishment.

TEMPALT installation drawings, similar to SIDs are also required. The sponsoring activity is responsible for developing detailed installation drawings and for providing them to the SPM with adequate time for the applicable PY to review. Minimal review time is 30 days.

While the SPM does not "certify" the adequacy of TEMPALT logistics products as it does for SHIPALTs, and the FMP ILS Certification Milestones do not apply, any and all ILS products that will be provided for the purposes of supporting the operation, testing and maintenance of the TEMPALT shall be documented on an ILS Certification Form. It is recommended that a completed ILS Certification Form be provided to the SPM in sufficient time, prior to installation, to allow the SPM ample time to review and resolve any potential supportability issues surrounding the installation and support of the TEMPALT (preferably 4 months prior to installation, but NLT 2 months prior to installation). Furthermore, TEMPALT Configuration

Status Accounting (CSA) requirements shall be documented in the ship's Current Ship Maintenance Project (CSMP) using the Departure From Specification (DFS) process as well as through the CDMD-OA process used for SHIPALTS.

Scheduling for TEMPALTs shall be performed in the same manner as SHIPALTs.

9-10.6.1 TEMPALT Installation and Removal Messages

The sponsoring activity will notify the cognizant SPM, CINC, and TYCOM by naval message when any TEMPALT installation is accomplished on any active ship and when any TEMPALT installation is relocated or removed. At a minimum, installation messages will contain the TEMPALT number and title, ship's name and hull number, date of installation, any preliminary ILS provided, proposed removal date, the sponsoring activity's point of contact and references to the SPM approval and TYCOM's authorization. In addition, the installation message will include a statement certifying that the installation was accomplished in accordance with the TEMPALT installation drawings; and any discrepancies were adjudicated in accordance with reference S9(aa), as applicable. If training is required, the installation message will also include names of ship's personnel trained to operate and maintain the TEMPALT equipment. Removal messages will contain the TEMPALT number and title, ship's name and hull number, date of removal, and a statement certifying that the ship was restored to original configuration or any outstanding related item preventing restoration.

9-10.7 Responsibilities

9-10.7.1 Sponsoring Activity

- Identify those TEMPALTs which support a special mission for the duration of a specific deployment and which are being considered for class and multi-ship approval.
- Provide project or program funding and coordination for all phases of TEMPALT development, including detailed design packages, installation, and restoration of the ship to its original configuration.
- Identify installation test and evaluation requirements of all TEMPALTs.
- Develop the TEMPALT JCF and submit to the SPM for approval.
- Develop TEMPALT installation drawings.
- For the purpose of adjudicating nonconformance, TEMPALT drawings are considered nondeviation drawings. In cases where the approved TEMPALT design must be modified to suit a particular installation, the required nonconformance to TEMPALT design will be adjudicated by the IA in accordance with DFS procedures of reference S9(aa) Volume V Part I Chapter 8.
- Develop the TEMPALT POA&M.
- Ensure that the design documentation for TEMPALTs has been approved by the SPM prior to the start of ship-work in accordance with the policy and procedures of this subsection.
- Ensure that authorization has been obtained from the applicable TYCOM prior to installation.
- Ensure all TEMPALTs impacting CS equipment are reviewed by the CSE as well as the Warfare Area Manager (WAM).
- Establish a MOA for all work to be performed and accomplish all work in accordance with reference S9(aa).
- Notify the SPM and applicable TYCOM(s) by naval message whenever a TEMPALT has been accomplished, relocated, or removed.

- Provide a copy of the approved technical data package to the ship each time the alteration is accomplished.
- Provide all ILS products, including Training, required for the operation and maintenance of the TEMPALT equipment during its installed time frame or use aboard ship.
- Provide the CDM CDMD-OA records for TEMPALT equipment after installation.

9-10.7.2 SPM

- Ensure that TEMPALTs are technically satisfactory (e.g., safe, weight and moment, stability, missile hazard, access to and operation of vital equipment, etc.).
- Obtain PY review and input on TEMPALTs. Ensure ship impacts (e.g. cabling, foundations, new/relocated equipment, power, etc.) are considered in TEMPALT installation drawings.

9-10.7.3 TYCOM

- Authorize accomplishment of only those TEMPALTs that have been approved for accomplishment by the SPM.
- Adjudicate non-conformance to approved TEMPALT design in accordance with DFS procedures or Reference S9(aa) Volume V Part I Chapter 8.
- Maintain administrative control and monitor installation and removal of TEMPALTs.
- Notify CNO when authorizing installation of TEMPALTs that may impact ship mission or operational capabilities.

9-10.8 Configuration Status Accounting (CSA)

CSA for TEMPALTs shall be documented in CDMD-OA as it is for SHIPALTs, AERs, and equipment alterations, as well as the ship's CSMP using the DFS process. Configuration development will normally be to the top-level configuration to provide for the general identification of the equipment installed by the TEMPALT. This allows the CDM to identify the equipment and establish a CI record in CDMD-OA for purposes of CSA once the installation has been validated as complete. This data will be provided by the sponsoring activity in accordance with the requirements of references S9(c) and S9(g) and Section 8 of this manual. CSA for TEMPALTs shall also be accomplished utilizing the DFS process as described in reference S9(aa) Volume V Part I Chapter 8. This process requires that the DFS be entered into the CSMP and the installing activity database until such time as the ship's original configuration is either restored or permanent approval of the TEMPALT is authorized.

Ship's Force shall provide the sponsoring activity a DFS number. The subject line of the DFS shall read: "DFS Request-New Technology Test Initiative." The sponsoring activity shall provide the following information in block 14 of the DFS.

- Description of TEMPALT. (Include anticipated benefit)
- Product and Manufacturer
- Sponsoring Agencies (i.e. Port Engineer, Depot Facility, SPM, SPAWAR, FTSCLANT, NSWC, ISEA, Contractors, etc.)
- Technical and other assists if required (Ship's Force, SIMA, RRC, etc.)
- Estimated Date of Installation

- Define Test initiative and compartment location (system, equipment, component, hull structure, etc)
- Describe long/short term ILS plans, if available (for parts support, other new maintenance requirements, PMS, and technical documentation)
- Provide estimated test completion date and sponsoring agency evaluation POA&M

Ship's Force shall forward the DFS to the applicable TYCOM for approval. The TYCOM shall provide a copy of the approved DFS to the requesting ship and TEMPALT sponsor.

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APPENDIX B: TEMPORARY ALTERATION DATA PACKAGE

OED SCI MLS ARCHITECTURE

LCC-19 (USS BLUE RIDGE)

TEMPALT TA134

REV (-)

Prepared By

PMW-157-1F
SPAWAR

14 May 2003

TEMPORARY ALTERATION
(TEMPALT) DATA PACKAGE

USS BLUE RIDGE (LCC-19)

TEMPORARY ALTERATION BASELINE SPECIFICATION

OED SCI MLS ARCHITECTURE

Prepared By:

PMW-157-1F
SPAWAR

SUBMITTAL DATE: 14 May 2003

ALTERATION DATE: TBD

SUBMITTED BY:

(SSC San Diego)	John Falbo	DATE

REVIEWED BY:

SPAWAR

(04R-3)	Bob Buckley	DATE

CNSP

(N43)	LT Kevin Pettit	DATE

APPROVED BY:

(PMS 470)	Joe Dobrzynski	DATE

INSTALLATION BRIEF

This TEMPALT Data Package provides the necessary information to install OED SCI MSL Architecture aboard the USS Blue Ridge (LCC-19). This OED SCI MSL Architecture Force Level suite of equipment consists of two SCI servers (HP J6000), one SCI OED workgroup switch (OS-4024), one SCI Media Converter (MILAN 9100X), one Sun Rave Radiant Mercury, two SCI client workstations (HP J6000), one SCSI Expansion Chassis, one Disk Storage System (DS2100), and one JWICS Router in Rack No. 1. Additionally, one Coalition server (HP J6000), one Media Converter (MILAN 9100X), one Stoneghost Metaframe PC Server (V133-1126), one Bison Metaframe PC Server (V133-1126), one JWICS Metaframe PC Server (V133-1126), one Targeting client workstation (HP J6000), one Collections client workstation (HP J6000) and six CISCO 2621 Routers (Stoneghost, Bison, COWAN A, COWAN C, COWAN J and COWAN K) in Rack No.2 will be supplied. Also required on the SCI Enclave are two (2RU) Neptune FPDs, four remote SCI Client Workstations (including FPD, KYBD and TBALL) and seven SCI Client Desktop Workstations (including FPD, KYBD and TBALL). A 100Mb port on the SCI edge switch (ESXXXXX) will be necessary to provide the required LAN connectivity.

There will be 115VAC/60Hz power requirements for the uninterruptible power sources for all equipment. Also, all drops will require access to a ships power panel, which has a current feed sufficient to supply 1.5KVA UPS.

The planned equipment installation will be completed NLT than TCD which is TBD.

SHIP APPLICABILITY

USS Blue Ridge (LCC-19)

ALTERATION BRIEF

Project Title:	OED SCI MLS Architecture Installation for the USS Blue Ridge
Security Classification:	SCI
Sponsoring Activity:	PMW-157
Applicable Ship:	USS Blue Ridge (LCC-19)
Applicable TYCOM: Overall Port Eng. Port Engineer	COMNAVSURFPAC Bob Keyes (619.556.0240) Charlie Sutton (011.81.80.311)
Alteration Site:	Yokosuka, JAPAN
Alteration Activity:	PMW-157 SPAWARSYSCEN San Diego 4301 Pacific Highway San Diego, CA 92110-3127
Alteration Duration:	One year (365 days)
Alteration Technical Supporting Requirements:	N/A

ATTACHMENTS

A. Plan of Action and Milestones (POA&M)
B. Temporary Alteration Impact Data
C. Stress Calculations (N/A)
D. Calculated Weight and Moments Record
E. Integrated Logistics Support (ILS) General Information
Removal/Exit Plan
OED SCI MLS Architecture Installation, LCC-19 Tempalt Installation Drawings

REFERENCES

NAVSEA TECHSPEC 9090-310D Alterations to Ships Accomplished by Alteration Installation Team.
SSCSDINST 4720.1 Shipboard Installation Guidance
SWRMCINST 4790.3 SWRMC Structure, Policies and Procedures
SPAWAR C4I Temporary Alterations Guidelines, Version 4, DTD October 29, 2002

OED SCI MLS Architecture Force Level System Installation

The purpose of this TEMPALT is to improve functionality; refresh technology and provide multi-level all source intelligence fusion, analysis and dissemination. Provides single common desktop solution for accessing multiple security domains. This is accomplished through the introduction of Coalition, Stoneghost, Bison, JWICS and SCI Backup servers on the SCI enclave.

OED SCI MLS Architecture Force Level interface requirements include:
115VAC, 60Hz, single phase power:
two 20A circuit breaker located in FIC
additional, potential UPS sources to be identified near workstation locations.
SCI port availability at 100Mb.
Use available ports on ESXXXXX located in FIC
SCI LAN:
SCI server, qty. 2 (HP J6000)
Coalition server, qty. 1 (HP J6000)
Stoneghost PC server, qty. 1 (Vision V133-1126)
Bison PC server, qty. 1 (Vision V133-1126)
JWICS PC server, qty. 1 (Vision V133-1126)
Sun Rave Radiant Mercury, qty. 1 (RM2DIA-AX1105)
SCSI Expansion Chassis, qty. 1
Disk Storage System, qty. 1 (DS2100)
IWO Client Workstation, qty. 1 (HP J6000)
AIWO Client Workstation, qty. 1 (HP J6000)
Targeting Client Workstation, qty. 1 (HP J6000)
Collections Client Workstation, qty. 1 (HP J6000)
PDA, qty. 2 (1RU)
Neptune FPD, qty. 2
Router, qty. 7 (CISCO 2621)
Media Converter, 8 port, qty. 2 (MILAN 9100X)
24 Port Workgroup Switch, qty. 1 (OS 4024)
UPS power source, qty. 9
NEC FPD workstation, qty. 2 (LCD 1850X)
GCCS-M software

The detailed hardware list is as follows:

Common Name	Model Number	Height	Width	Depth	Weight	APL	Power (Amps) Max/Avg	Power (Watts)
HP J6000 Computer (3RU)	A5990A	5.22"	17.2"	24.5"	37.5 lbs		6.0/2.7 Amps	304 Watts
HP J6000 Workstation, SCI Client (2RU)	A5990A				48 lbs			
SUN RAVE Computer (Radiant Mercury) (2RU)	RM2DIA-AX1105	3.5"	19.0"	24.0"	22 lbs		2.0/0.87 Amps	98 Watts
Neptune Workstation Center (2RU)	136-32000	3.5"	19.0"	23.75"	45 lbs		0.8/0.65 Amps	60 Watts
PDA (1RU)	SAIC-112-32500	1.75"	19.0"	13.0"	15.75 lbs	00042434	20 Amps Max Input	N/A
APC UPS, 1.5KVA	SUA1500X93	8.5"	6.7"	17.3"	53 lbs		12.3/0.35 Amps	40 Watts
UPS, 2.4KVA (3RU)	UPS1-2.4K-1G-SRNDTI-J3	5.22"	19.0"	27.48"	101 lbs		20.0/2.0 Amps Max Load	225 Watts
Media Conversion Chassis, 8 Converters (1RU)	MILAN-9100X	1.75"	19.0"	10.5"	6 lbs		2.5/1.0 Amps	113 Watts
SCSI Expansion Chassis (1RU)	168-32000	1.75"	19.0"	7.5"	7.3 lbs		2.0/1.0 Amps	113 Watts
Disk Storage System (1RU)	DS2100	1.7"	18.0"	15.0"	17.89 lbs		6.0/1.0 Amps	113 Watts
Workgroup Switch, 24 Port (1RU)	OS-4024	3.5"	19.0"	12.2"	8 lbs		2.7/0.58 Amps	56 Watts
Router, Modular Access (1RU)	CISCO 2621	1.69"	17.5"	11.8"	8.85 lbs		1.5/0.1 Amps	11 Watts
Metaframe PC Server (1RU)	V133-1126				20 lbs			
NEC Flat Panel Display	LCD-1850X				18.7 lbs			

This installation will have no impact on ship's systems or safety. Pre and post installation testing will be accomplished by ship's force to ensure no tactical system degradation has occurred as a result of the installation or removal of this TEMPALT.

ATTACHMENT A

PLAN OF ACTION AND MILESTONES (POA&M)

1. Perform Ship In-Brief and Ship Survey -	TBD
2. Submit TCCP to 04R3 for Development of TJCF	05/14/03
3. Submit Non-Standard Offer Message to FLTCOM / TYCOM	DTG
4. Submitted to eCCB (If Applicable)	N/A
5. Approval of TCD Waiver (If Applicable)	DTG
6. Receive Authorization for Install from FLTCOM / TYCOM -	DTG
7. Develop Drawing and TEMPALT Data Package -	06/01/03
8. Submit TEMPALT Data Package to 04R-3D for review -	05/14/03
9. ILS support Documentation -	06/15/03
10. Assembly Fabrication (If Applicable)	05/20/03
11. Submit TEMPALT to SPM for approval -	05/27/03
12. Receive Approval from Ship Program Manager (SPM)-	06/02/03
13. Perform RMMCO Check-in -	06/02/03
14. Begin Equipment Installation -	06/09/03
15. Complete Installation -	06/22/03
16. Perform RMMCO Checkout -	06/30/03
17. Perform RMMCO Check-in for Removal -	06/01/04
18. Begin TEMPALT Removal -	06/08/04
19. Complete Removal -	06/22/04
20. Perform RMMCO Checkout -	06/22/04

ATTACHMENT B

TEMPORARY ALTERATION IMPACT DATA

1 Shipboard Location:

1.1 TEMPALT Equipment –FIC (3-67-0-Q), N2 Office Space (3-57-0-Q), Cryptology Office (3-81-1-Q), and SUPPLOT (2-88-1-C)

2 Power Requirements: 115VAC, 60Hz, single phase

3 Power Source: Ships Power Distribution Breaker/Fuse Panels (two 20A Circuits)

4 Inputs to Alteration:

- Ship's 115 VAC, 60 Hz, single phase power
- 100Mb connection to SCI LAN

5 Outputs from Alteration: 100Mb connection from associated Backbone or Edge switch.

6 Impact on Ship's System:

6.1 Weight/Moment:

Added weight (Net): 1183 lbs (I)
VM: 50.44 VCG
LM: 7.6 LCG (F)
TM: 22.5 TCG (P)

6.2 Ship Dynamics: No Impact

6.3 Maneuverability: No Impact

6.4 Tanks: No Impact

6.5 Habitability: No Impact

6.6 EMI/RFI: No Known Impact

6.7 Communications Security (TEMPEST): Cables associated with this TEMPALT will be fabricated in accordance with NSTISSAM TEMPEST 2-95 with amendment 2-95A and IA-PUB-5239-31

6.8 System(s)/Equipment(s)/Capability(ies) Disabled: No Impact

6.9 Equipment Rip-out: No Impact

6.10 Heat Load: No Impact

7 Impact on Safety:

7.1 Watertight Integrity: No Impact

7.2 Subsafe: Not Applicable

7.3 Life Support: No Impact

7.4 Personnel Safety: No Impact

7.5 Existing Equipment Safety: No Impact

8. Testing:

    8.1 All new cables will be tested by the installing activity for continuity and insulation resistance.

    8.2 Pre and post installation testing and pre and post removal testing of the shipboard system/equipment will be performed by ship’s force to ensure no system degradation has occurred as a result of installation or removal of the TEMPALT.

ATTACHMENT C

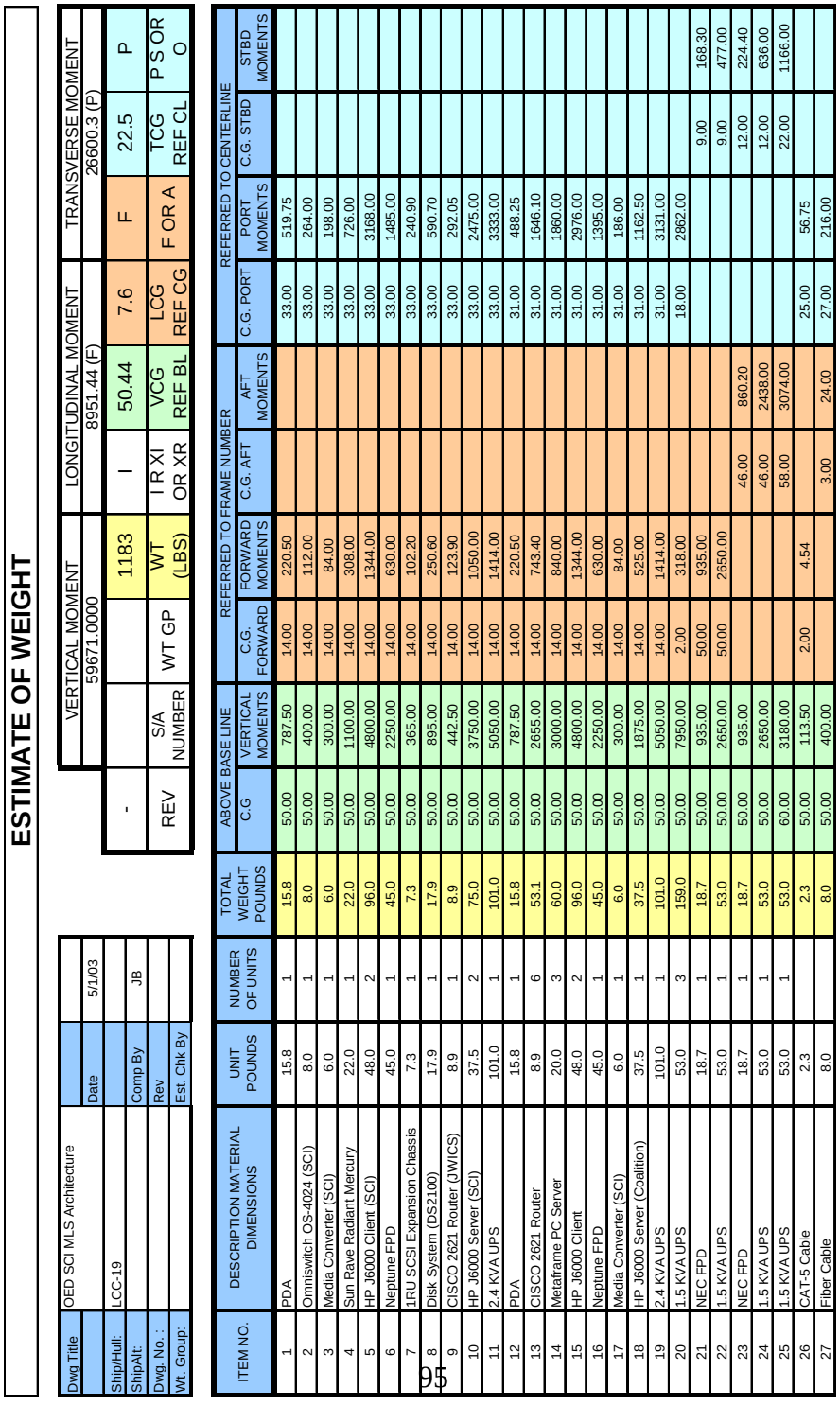
STRESS CALCULATIONS

The equipment involved in this installation is not of sufficient weight or size to require stress calculations. No formal stress analysis for this TEMPALT is warranted.

ATTACHMENT D

CALCULATED WEIGHT AND MOMENTS RECORD

The net increase in weight from this TEMPALT is negligible (1183 lbs):



ESTIMATE OF WEIGHT

Dwg Title	OED SCI MLS Architecture	Date	5/1/03
Ship/Hull:	LCC-19		
ShipAlt:		Comp By	JB
Dwg. No. :		Rev	
Wt. Group:		Est. Chk By	

VERTICAL MOMENT			LONGITUDINAL MOMENT		TRANSVERSE MOMENT		
59671.0000			8951.44 (F)		26600.3 (P)		
-		1183	I	50.44	7.6	F	22.5	P
REV	S/A NUMBER	WT GP	WT (LBS)	I R XI OR XR	VCG REF BL	LCG REF CG	F OR A	TCG REF CL	P S OR O

ITEM NO.	DESCRIPTION MATERIAL DIMENSIONS	UNIT POUNDS	NUMBER OF UNITS	TOTAL WEIGHT POUNDS	ABOVE BASE LINE		REFERRED TO FRAME NUMBER			REFERRED TO CENTERLINE			
					C.G	VERTICAL MOMENTS	C.G. FORWARD	FORWARD MOMENTS	C.G. AFT	AFT MOMENTS	C.G. PORT	PORT MOMENTS	C.G. STBD	STBD MOMENTS
1	PDA	15.8	1	15.8	50.00	787.50	14.00	220.50			33.00	519.75		
2	Omniswitch OS-4024 (SCI)	8.0	1	8.0	50.00	400.00	14.00	112.00			33.00	264.00		
3	Media Converter (SCI)	6.0	1	6.0	50.00	300.00	14.00	84.00			33.00	198.00		
4	Sun Rave Radiant Mercury	22.0	1	22.0	50.00	1100.00	14.00	308.00			33.00	726.00		
5	HP J6000 Client (SCI)	48.0	2	96.0	50.00	4800.00	14.00	1344.00			33.00	3168.00		
6	Neptune FPD	45.0	1	45.0	50.00	2250.00	14.00	630.00			33.00	1485.00		
7	1RU SCSI Expansion Chassis	7.3	1	7.3	50.00	365.00	14.00	102.20			33.00	240.90		
8	Disk System (DS2100)	17.9	1	17.9	50.00	895.00	14.00	250.60			33.00	590.70		
9	CISCO 2621 Router (JWICS)	8.9	1	8.9	50.00	442.50	14.00	123.90			33.00	292.05		
10	HP J6000 Server (SCI)	37.5	2	75.0	50.00	3750.00	14.00	1050.00			33.00	2475.00		
11	2.4 KVA UPS	101.0	1	101.0	50.00	5050.00	14.00	1414.00			33.00	3333.00		
12	PDA	15.8	1	15.8	50.00	787.50	14.00	220.50			31.00	488.25		
13	CISCO 2621 Router	8.9	6	53.1	50.00	2655.00	14.00	743.40			31.00	1646.10		
14	Metaframe PC Server	20.0	3	60.0	50.00	3000.00	14.00	840.00			31.00	1860.00		
15	HP J6000 Client	48.0	2	96.0	50.00	4800.00	14.00	1344.00			31.00	2976.00		
16	Neptune FPD	45.0	1	45.0	50.00	2250.00	14.00	630.00			31.00	1395.00		
17	Media Converter (SCI)	6.0	1	6.0	50.00	300.00	14.00	84.00			31.00	186.00		
18	HP J6000 Server (Coalition)	37.5	1	37.5	50.00	1875.00	14.00	525.00			31.00	1162.50		
19	2.4 KVA UPS	101.0	1	101.0	50.00	5050.00	14.00	1414.00			31.00	3131.00		
20	1.5 KVA UPS	53.0	3	159.0	50.00	7950.00	2.00	318.00			18.00	2862.00		
21	NEC FPD	18.7	1	18.7	50.00	935.00	50.00	935.00					9.00	168.30
22	1.5 KVA UPS	53.0	1	53.0	50.00	2650.00	50.00	2650.00					9.00	477.00
23	NEC FPD	18.7	1	18.7	50.00	935.00			46.00	860.20			12.00	224.40
24	1.5 KVA UPS	53.0	1	53.0	50.00	2650.00			46.00	2438.00			12.00	636.00
25	1.5 KVA UPS	53.0	1	53.0	60.00	3180.00			58.00	3074.00			22.00	1166.00
26	CAT-5 Cable	2.3		2.3	50.00	113.50	2.00	4.54			25.00	56.75		
27	Fiber Cable	8.0		8.0	50.00	400.00			3.00	24.00	27.00	216.00		

ATTACHMENT E

INTEGRATED LOGISTICS SUPPORT (ILS)

Spare parts and special test equipment are not required to maintain the equipment. Parts support for all of the POR equipment will be provided by NAVICP and any onboard allowances will be determined at a later time. SPAWAR will provide interim operator training at the time of installation. Maintainer training will not be required as all equipment is POR. All follow-on training is provided using OED SCI MLS Architecture computer based training CD. There is also a help file built within the software. Technical support will be available through their website https://www.jdms.spawar.navy.mil. A 1-800-838-1816 number is also available for further help.

No COSAL is warranted or has been developed for this TEMPALT.

An OED SCI MLS Architecture Installation TEMPALT Integrated Logistics Support Certification Form has been completed for this TEMPALT and can be viewed on the PMW 157 website https://mccs.spawar.navy.mil/index.cfm.

For any COSAL and / or ILS questions, comments or requests contact Tim Green of SPAWAR System Center San Diego, (858) 537-0598, tim.green@navy.mil.

ATTACHMENT F

REMOVAL/EXIT PLAN

At the completion of the ship's deployment, USS Blue Ridge will coordinate with COMNAVSURFPAC N43 and USJFCOM to determine the disposition and removal schedule of this TEMPALT.

The current planned dates for equipment removal and de-installation is TBD.

APPENDIX C: LCC-19 OED TEMPALT ARRANGEMENT DRAWINGS

DRAFT JUNE 3, 2003

GENERAL NOTES

1. THIS IS A TEMPALT INSTALLATION INSTRUCTION DEVELOPED FOR ACCOMPLISHMENT OF TEMPALT TA134, BASED ON A SHIPCHECK OF THE USS BLUE RIDGE (LCC-19). AN APPLICABILITY SHIPCHECK IS REQUIRED PRIOR TO ITS USE ON OTHER SHIPS.
2. THIS DRAWING IS BASED UPON THE REQUIREMENTS OF NAVSEA S9AA0-AB-GOS-010/GSO (2000 EDITION) WHOSE PROVISIONS SHALL PREVAIL IN AREAS WHERE THIS DRAWING IS SILENT.
3. EXCEPT WHERE OTHERWISE NOTED OR APPROVED BY NAVSEA, THE EFFECTIVE DATE OF FEDERAL OR MILITARY SPECIFICATIONS, PUBLICATIONS AND STANDARD/TYPE DRAWINGS AND REVISIONS AND CHANGES THERETO SHALL BE THE EFFECTIVE DATE OF NAVSEA S9AA0-AB-GOS-010/GSO. LATER SPECIFICATION REVISIONS MAY BE USED PROVIDED THAT THEY MEET THE INTENT AND INTERFACE REQUIREMENTS OF THE SPECIFICATION INVOKED FOR THE SPECIFIC AVAILABILITY.
4. ENGINEERING DATA SUPPORTING THIS DRAWING IS NOT REQUIRED.
5. THE PURPOSE OF THIS DRAWING IS TO SHOW ARRANGEMENT MODIFICATIONS INCIDENTAL TO THE INSTALLATION OF TEMPALT OED TA134 USS BLUE RIDGE (LCC-19).
6. ABBREVIATIONS UTILIZED ON THIS DRAWING ARE IAW ASME Y14.38 EXCEPT FOR THE FOLLOWING: (N) NEW, (E) EXISTING, (M) MODIFIED, (R) RELOCATED.
7. THE NUMBER AND LETTER IN PARENTHESES ( ) UNDER EACH VIEW DENOTE THE VIEW FROM WHICH IT WAS TAKEN.
8. FOUNDATIONS ARE CONSIDERED EXISTING STRUCTURES FOR THE PURPOSE OF THIS DRAWING.
9. MATERIAL SOURCE INDICATIONS SHOWN IN THE LIST OF EQUIPMENT SOURCE COLUMN ARE AS FOLLOWS:
   N = NEW
   E = EXISTING ITEM (NOT RELOCATED)
   R = EXISTING ITEM RELOCATED
10. ALL EXISTING EQUIPMENT IS SHOWN BY DASHED LINES (— — — —). ALL NEW AND RELOCATED EQUIPMENT IS SHOWN BY SOLID LINES (———). MATERIAL SHOWN THUS ////// SHALL BE REMOVED AND DISPOSED OF IN THE FOLLOWING MANNER: ALL COMMUNICATION SECURITY EQUIPMENT (INCLUDING ASSOCIATED ANCILLARY EQUIPMENT) IS TO BE TURNED OVER TO THE SHIPBOARD CMS CUSTODIAN; REMOVED ITEMS (NOT RELOCATED) SHALL BE RETAINED BY THE SPAWAR PROGRAM OFFICE OR ISEA PERSONNEL, OR THEIR DESIGNEE AS DIRECTED, AND STORED AT AN OFF-SHIP LOCATION FOR RE-INSTALLATION UPON REMOVAL OF THIS TEMPALT.
11. MATERIAL SOURCE INDICATIONS SHOWN IN THE LIST OF EQUIPMENT TO BE REMOVED SOURCE COLUMN ARE AS FOLLOWS:
   S = SCRAP
   F = FORWARD
   R = REMOVE & RETAIN (GN-10)
12. LOCATING DIMENSIONS FOR MISCELLANEOUS EQUIPMENT NOT INSTALLED BY A HULL FOUNDATION SHALL HAVE A ±6" TOLERANCE, PROVIDING THE EQUIPMENT REMAINS FUNCTIONAL, OPERATIONAL, AND MAINTAINABLE AND DOES NOT CREATE AN INTERFERENCE WITH ANY OTHER NEW OR EXISTING EQUIPMENT.
13. ALL ELECTRICAL EQUIPMENT AND CABLES, EXCEPT CABLES AND EQUIPMENT ASSOCIATED WITH SECURE PROCESSING EQUIPMENT OR LOCATED IN SECURE SPACES, SHALL BE BONDED AND GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 406 OF NAVSEA S9AA0-AB-GOS-010/GSO AND MIL-STD-1310 AS MODIFIED BY OD32382.
14. ALL ELECTRICAL CABLES AND EQUIPMENT ASSOCIATED WITH SECURE PROCESSING OR LOCATED IN SECURE SPACES SHALL BE INSTALLED-INCLUDING BONDING AND GROUNDING-IN ACCORDANCE WITH SECTION 402 OF NAVSEA S9AA0-AB-GOS-010/GSO EXCEPT THAT THE DEPT OF THE NAVY IA PUB-5239-31 (JUNE 2000 EDITION) USED IN CONJUNCTION WITH NSTISSAM TEMPEST/2-95, RED/BLACK INSTALLATION GUIDANCE SHALL BE USED IN LIEU OF MIL-STD-1680.
15. THIS IS INTENDED AS A TEMPALT INSTALLATION AND ALL EQUIPMENT AND AREAS DISTURBED BY THIS INSTALLATION ARE TO BE RESTORED TO MATCH THE ORIGINAL, PRE-EXISTING CONDITION FOLLOWING THE REMOVAL OF THIS TEMPALT.
16. EQUIPMENT SHALL BE REMOVED FROM JOTS 1 AND JOTS 14/17 CONSOLES AND REPLACED WITH GFM ITEMS IN ACCORDANCE WITH THIS TEMPALT. THE CONSOLES SHALL BE DESIGNATED 55" OED SERVER RACK A AND 55" OED SERVER RACK B.

LIST OF EQUIPMENT (QUANTITY FOR ONE SHIP)

ITEM NO.	QTY RQD	DESCRIPTION	SOURCE N	SOURCE E	SOURCE R	ORD DWG REF	FDN DWG REF	APL NO.	UNIT WT	HD WATTS	REMARKS
1*	7	HP J6000 W/ RACKMOUNT	7					–	375	304	A5990A
2*	2	NEPTUNE WORKSTATION CENTER	2					–	45	60	136-32602 SAIC
3*	2	UNINTERRUPTIBLE POWER SOURCE, 2.4 KVA	2					–	101	225	UPS1-2.4-1G-SRNDT1-J3
4*	2	CHASSIS MEDIA CONVERTER, MILAN	2					00043463	6.0	113	+ 1 EA MIL-9000PSAC, 4 EA MIL-140TRM, 8 EA MIL-C102RM
5*	7	CISCO ROUTER	7					–	6	40	CICSCO2621-DC
6*	3	VISION 1RU SERVER	3					–	–	–	V133-1126
7*	2	PDA	2					00041215	15.75	–	112-32500
8*	1	SCSI EXPANSION CHASSIS	1					–	7.3	113	168-3200 (65-32132-1)
9	1	OS-4024	1					–	8	65	ALCATEL SWITCH OS-4024CF
10*	1	SUN ULTRA 5	1					–	22	98	RM2DIA-AX1105
11*	1	DS2100	1					–	48	304	A5675A
12	7	HP J6000, WORKSTATIONS	7					–	375	304	–
13	3	FIBER 1 X 8 SWITCH RJ-45	3					–	–	–	MIL-S801PSCXX
14	9	HOFFMAN BOX	9					–	–	–	2 LOCATED ADJACENT TO SERVER RACK A AND B
15*	1	FLAT PANEL DISPLAY	1					–	–	–	LCD 1850X

* ITEMS ARE GFM, SUPPLIED BY SPAWAR.

LIST OF EQUIPMENT TO BE REMOVED (QUANTITY FOR ONE SHIP)

ITEM NO.	QTY RQD	DESCRIPTION	SOURCE S	SOURCE F	SOURCE R	ORD DWG REF	FDN DWG REF	APL NO.	UNIT WT	HD WATTS	REMARKS
R1	4	CP-2184	–	–	4	–	–	–	–	–	NOTE 16
R2	2	PDA	–	–	2	–	–	–	–	–	NOTE 16
R3	2	1.5 KVA UPS	–	–	2	–	–	–	–	–	NOTE 16
R4	2	EXPANSION CHASSIS	–	–	2	–	–	–	–	–	NOTE 16
R5	–	–	–	–	–	–	–	–	–	–	–

REVISIONS

REV	ZONE	DESCRIPTION	BY	DATE	APPROVED

DISTRIBUTION LIMITED TO D.O.D. AND D.O.D. CONTRACTORS IN ORDER TO PROTECT CRITICAL TECHNOLOGY. OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO COMMANDER, NAVAL SEA SYSTEMS COMMAND (SEA 09B2), WASHINGTON NAVY YARD, D.C. 20376-7012

NOT APPLICABLE

REV	SHIPALT NUMBER	WT GP	WT (LBS)	N R OR XR	VCG REF BL	LCG REF ⅢⅢ	F OR A	TCG REF CL	P S OR O	VAL BY

WEIGHT CONTROL DATA
LEVERS IN FEET TO THE NEAREST TENTH OF A FOOT
USE SEPARATE LINES FOR EACH WT GRP. S/A, REV, WT INSTL, WT RMV
I=INSTALL R=REMOVE XI=LOAD ITEM INSTALLED XR= LOAD ITEM REMOVED
F=FWD A=AFT P=PORT S=STBD O=C

THIS DRAWING MODIFIES
NO KNOWN DRAWING.

REFERENCES

NO.	HULL	TITLE	IDENT
3	LCC-19	TEMPALT OED TA134 LCC-19 USS BLUE RIDGE CABLE RUNNING SHEETS	53711-413-7616248
2	LCC-19	TEMPALT OED TA134 LCC-19 USS BLUE RIDGE MOD TO BLK WRG DIAG	53711-413-7616247
1	STD	GENERAL SPECIFICATIONS FOR OVERHAUL OF SURFACE SHIPS (GSO) (2000 EDITION)	S9AA0-AB-GOS-010/GSO

DIMENSIONAL TOLERANCES – UNLESS OTHERWISE SPECIFIED

DIMENSION (IN)	MACHINED DECIMAL 2 PL	MACHINED DECIMAL 3 PL	FRACTION
UNDER 6	±.010	±.005	±1/64
6 TO 24	±.020	±.010	±1/32
OVER 24	±.030	±.015	±1/16
FILLETS & RADII TO BE 1/8			
TOL ON ANGLES ±0-30'			

GEOMETRIC (WHERE INDICATED) SYMBOL	GEOMETRY	TOLERANCE
⏥	FLATNESS	.0005 /IN
⊥	PERPENDICULAR	.001 /IN
//	PARALLELISM	.001 /IN
◎	CONCENTRICITY	AS NOTED
—	STRAIGHTNESS	.0005 /IN
SYM IAW ANSI Y14.5M-1982		

REVISION STATUS OF SHEETS: 1 2 3 4 5 6 7

SHIP APPLICABILITY: SHIP LCC-19 | REV – | SHIPCK BY – | DT XX/XX

CONTRACT NO. GS00T99ALD0210 FSCM NO. 4T323
AMSEC LLC
2829 GUARDIAN LANE
VIRGINIA BEACH, VA 23452-7328

PREPARED / CHECKED / ENGINEER / APPROVED: 05/20/03
AUTHORITY:

SPAWARSYSCEN SAN DIEGO
53560 HULL STREET
SAN DIEGO, CA
92152-5001

PMW 157 CAPT. RODRIGUEZ
PMW 157-MLS C. NEWCOMB
PMW 157-1F J. FAUBO

ACCEPTED FOR NAVSEA
APPROVED BY NAVSEA

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON NAVY YARD, D.C. 20376-7012

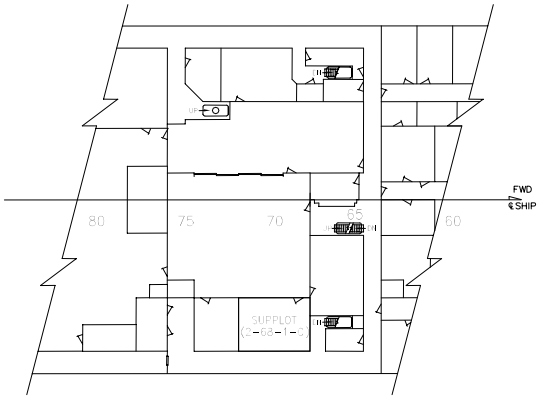
TEMPALT OED
TA134 LCC-19
USS BLUE RIDGE
MOD TO ARR

SIZE	FSCM NO.	WTGRP	NAVSEA DRAWING NO.	REV
F	53711	445	7616246	–

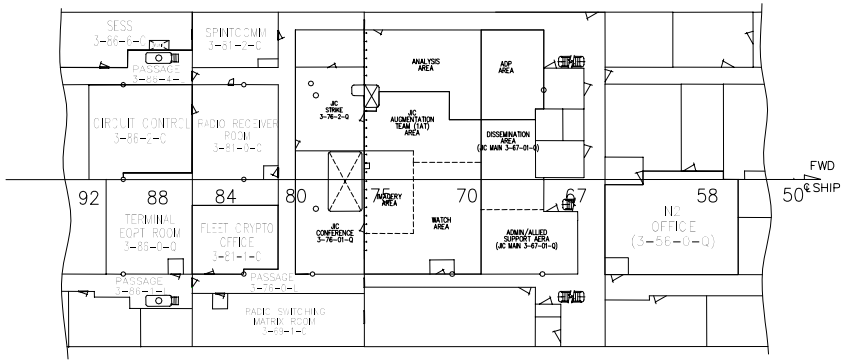
SCALE: AS SHOWN FILE: 16242001 SHEET 1 OF 7

JUNE 3, 2003 DRAFT

DRAFT MAY 20, 2003



KEY PLAN 13-D
SECOND DECK
SCALE: NONE



KEY PLAN 13-A
THIRD DECK
SCALE: NONE

(LCC-19)

SIZE	FSCM NO.	WTGRP	NAVSEA DWG NO.	REV.
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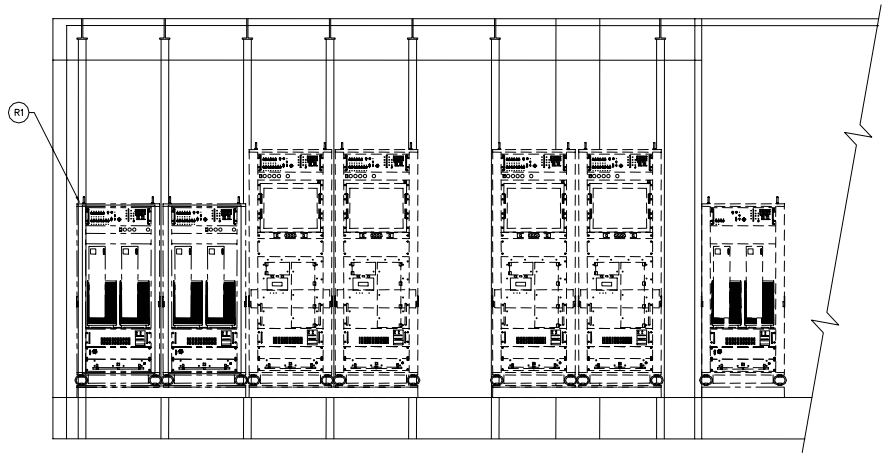
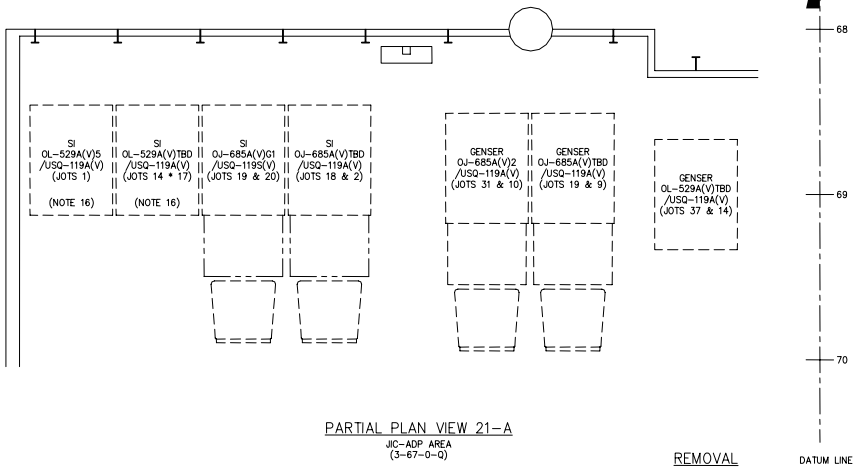
SCALE: NONE FILE: 7616246002 SHEET 2

MAY 20, 2003 DRAFT

DRAFT JUNE 3, 2003



SECTION 21–D
JIC–ADP AREA
(LOOKING FOWARD)



PARTIAL PLAN VIEW 21–A
JIC–ADP AREA
(3–67–0–Q)

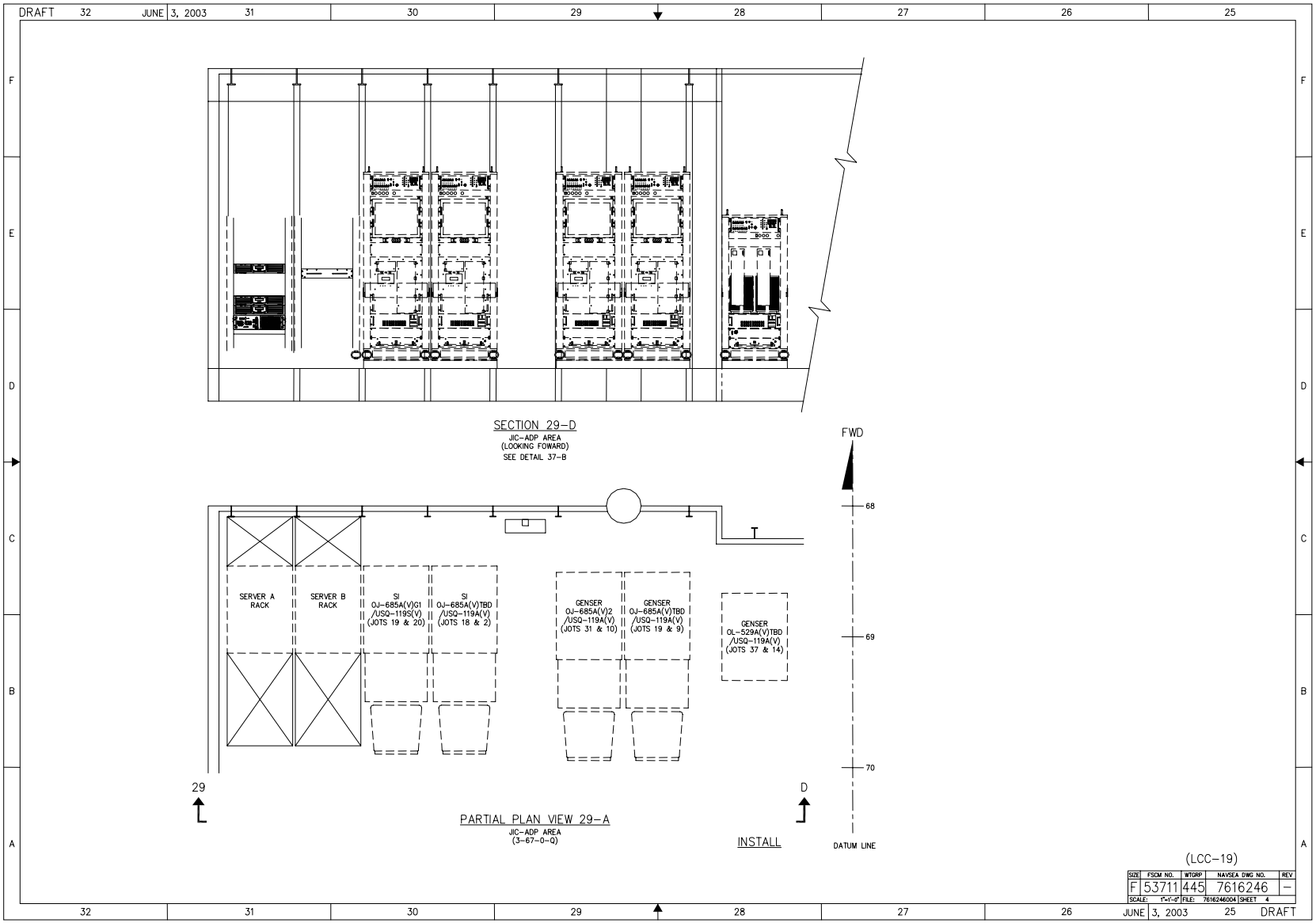
REMOVAL

(LCC–19)

SIZE	FSCM NO.	WTGRP	NAVSEA DWG NO.	REV
F	53711	445	7616246	–

SCALE: 1"=1'-0" FILE: 7616246003 SHEET 3

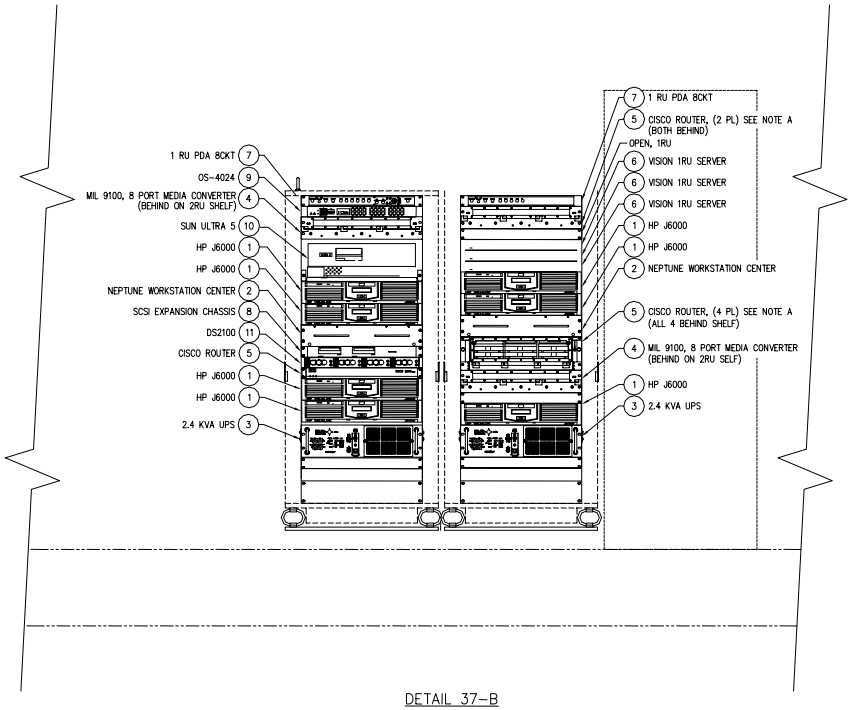
JUNE 3, 2003 DRAFT


DRAFT
JUNE 3, 2003
32
31
30
29
28
27
26
25
F
E
D
C
B
A
SECTION 29-D
JIC-ADP AREA
(LOOKING FOWARD)
SEE DETAIL 37-B
FWD
68
69
70
SERVER A RACK
SERVER B RACK
SI OJ-685A(V)G1 /USQ-119S(V) (JOTS 19 & 20)
SI OJ-685A(V)TBD /USQ-119A(V) (JOTS 18 & 2)
GENSER OJ-685A(V)2 /USQ-119A(V) (JOTS 31 & 10)
GENSER OJ-685A(V)TBD /USQ-119A(V) (JOTS 19 & 9)
GENSER OL-529A(V)TBD /USQ-119A(V) (JOTS 37 & 14)
29
D
PARTIAL PLAN VIEW 29-A
JIC-ADP AREA
(3-67-0-Q)
INSTALL
DATUM LINE
(LCC-19)
SIZE FSCM NO. WTGRP NAVSEA DWG NO. REV
F 53711 445 7616246 -
SCALE: 1"=1'-0" FILE: 7616246004 SHEET 4

DRAFT JUNE 3, 2003

NOTES:

A. THE CISCO ROUTERS MUST BE POSITIONED FACING EACH OTHER TO ALLOW AIR OUT/CABLE CLEARANCE. THESE ITEMS WILL HAVE A SPECIAL ENCLOSURE.



DETAIL 37-B

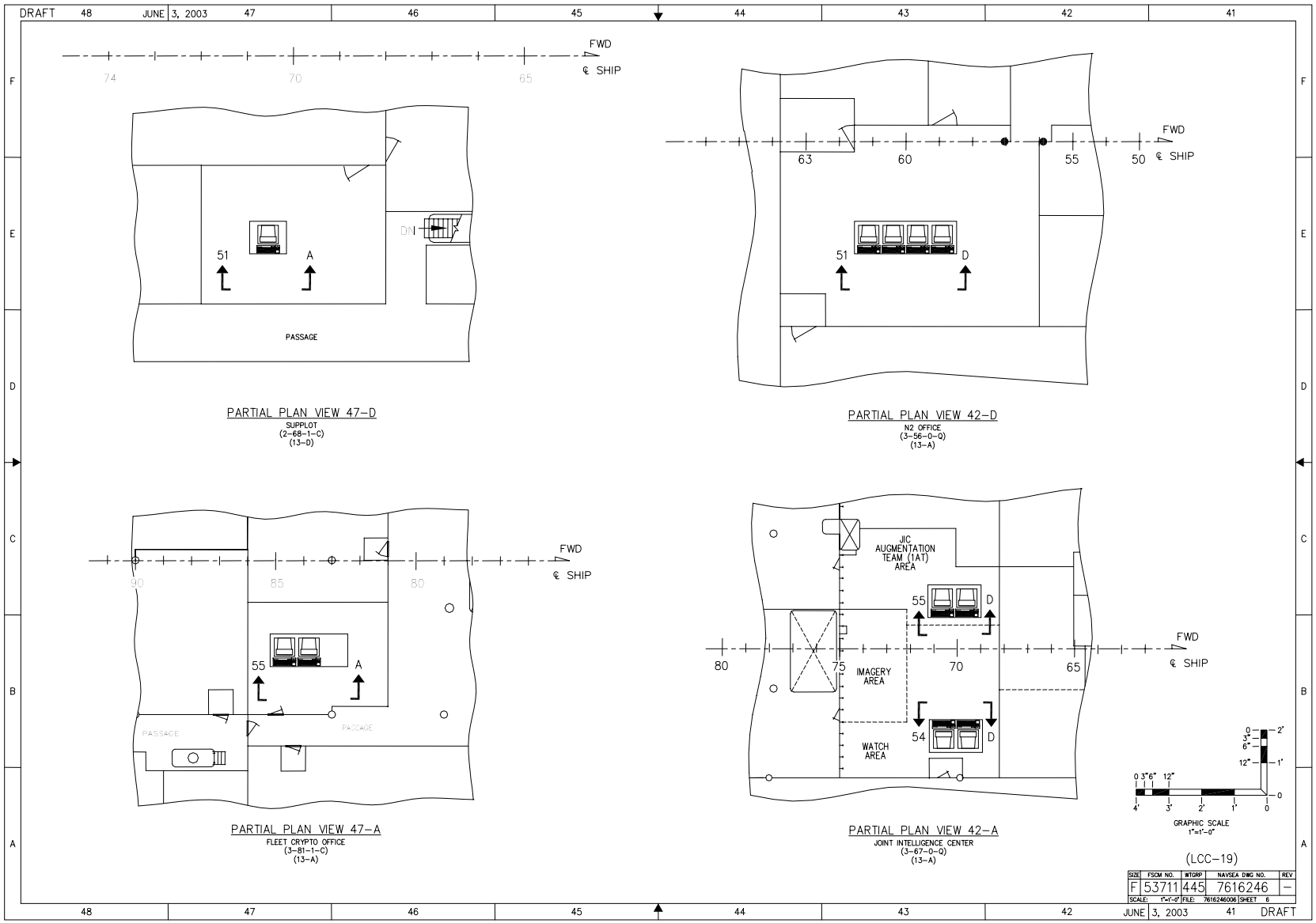
SERVER RACKS
(NOTE 16)

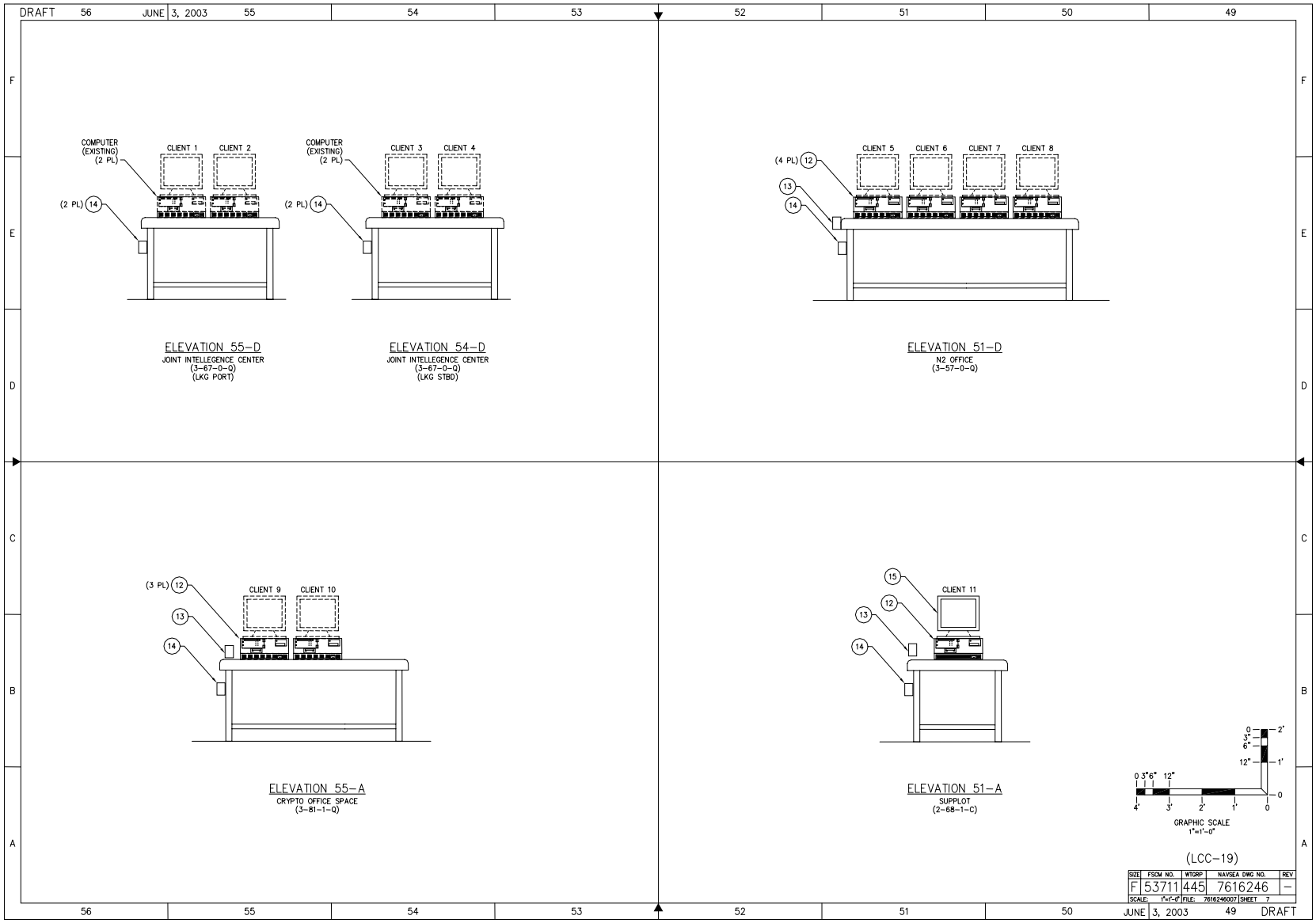
(LCC-19)

SIZE	FSCM NO.	WTGRP	NAVSEA DWG NO.	REV
F	53711	445	7616246	-

SCALE: 1"=1'-0" FILE: 7616246005 SHEET 5

JUNE 3, 2003 DRAFT


DRAFT
JUNE 3, 2003
48
47
46
45
44
43
42
41
FWD
℄ SHIP
74
70
65
51
A
DN
PASSAGE
PARTIAL PLAN VIEW 47–D
SUPPLOT
(2–68–1–C)
(13–D)
63
60
55
50
51
D
PARTIAL PLAN VIEW 42–D
N2 OFFICE
(3–56–0–Q)
(13–A)
90
85
80
55
A
PASSAGE
PARTIAL PLAN VIEW 47–A
FLEET CRYPTO OFFICE
(3–81–1–C)
(13–A)
JIC
AUGMENTATION
TEAM (1AT)
AREA
55
D
80
75
70
65
IMAGERY
AREA
54
WATCH
AREA
PARTIAL PLAN VIEW 42–A
JOINT INTELLIGENCE CENTER
(3–67–0–Q)
(13–A)
0 3"6" 12"
4' 3' 2' 1' 0
0 2"
3"
6"
12" 1'
GRAPHIC SCALE
1"=1'-0"
(LCC–19)
SIZE FSCM NO. WTGRP NAVSEA DWG NO. REV
F 53711 445 7616246 –
SCALE: 1"=1'-0" FILE: 7616246006 SHEET 6


DRAFT
JUNE 3, 2003
56
55
54
53
52
51
50
49
COMPUTER (EXISTING) (2 PL)
CLIENT 1
CLIENT 2
(2 PL) 14
ELEVATION 55-D
JOINT INTELLEGENCE CENTER
(3-67-0-Q)
(LKG PORT)
COMPUTER (EXISTING) (2 PL)
CLIENT 3
CLIENT 4
(2 PL) 14
ELEVATION 54-D
JOINT INTELLEGENCE CENTER
(3-67-0-Q)
(LKG STBD)
(4 PL) 12
13
14
CLIENT 5
CLIENT 6
CLIENT 7
CLIENT 8
ELEVATION 51-D
N2 OFFICE
(3-57-0-Q)
(3 PL) 12
13
14
CLIENT 9
CLIENT 10
ELEVATION 55-A
CRYPTO OFFICE SPACE
(3-81-1-Q)
15
12
13
14
CLIENT 11
ELEVATION 51-A
SUPPLOT
(2-68-1-C)
0 3"6" 12"
4' 3' 2' 1' 0
0 6" 12"
2' 1' 0
GRAPHIC SCALE
1"=1'-0"
(LCC-19)
SIZE FSCM NO. WTGRP NAVSEA DWG NO. REV
F 53711 445 7616246 -
SCALE: 1"=1'-0" FILE: 7616246007 SHEET 7

APPENDIX D: LCC-19 OED TEMPALT CABLE BLOCK DIAGRAM

DRAFT JUNE 3, 2003

GENERAL NOTES

1. THIS IS A TEMPALT INSTALLATION INSTRUCTION DEVELOPED FOR ACCOMPLISHMENT OF TEMPALT TA134, BASED ON A SHIPCHECK OF THE USS BLUE RIDGE (LCC-19). AN APPLICABILITY SHIPCHECK IS REQUIRED PRIOR TO ITS USE ON OTHER SHIPS.

THIS DRAWING IS BASED UPON THE REQUIREMENTS OF NAVSEA S9AA0-AB-GOS-010/GSO (2000 EDITION) WHOSE PROVISIONS SHALL PREVAIL IN AREAS WHERE THIS DRAWING IS

EXCEPT WHERE OTHERWISE NOTED OR APPROVED BY NAVSEA, THE EFFECTIVE DATE OF FEDERAL OR MILITARY SPECIFICATIONS, PUBLICATIONS AND STANDARD/TYPE DRAWINGS AND REVISIONS AND CHANGES THERETO SHALL BE THE EFFECTIVE DATE OF NAVSEA S9AA0-AB-GOS-010/GSO. LATER SPECIFICATION REVISIONS MAY BE USED PROVIDED THAT THEY MEET THE INTENT AND INTERFACE REQUIREMENTS OF THE SPECIFICATION INVOKED FOR THE SPECIFIC AVAILABILITY.

ALL INCIDENTAL MATERIAL REQUIRED TO ACCOMPLISH MODIFICATIONS AS SHOWN ON THIS DRAWING SHALL BE PROVIDED BY THE INSTALLING ACTIVITY. GFM WILL BE SUPPLIED BY SSC.

ELECTRICAL INSTALLATION DETAILS OF EQUIPMENT/MATERIAL INSTALLED OR MODIFIED BY THIS DRAWING SHALL COMPLY WITH THE REQUIREMENTS OF GROUP 300 AND 400 OF REFERENCE NO. 1 AND ELECTRIC PLANT INSTALLATION STANDARD METHODS FOR SURFACE SHIPS AND SUBMARINES, DOD-STD-2003 (NAVY), UNLESS OTHERWISE SPECIFIED BY THIS DRAWING OR OTHER APPROVAL OF THE DESIGN AGENT.

ABBREVIATIONS UTILIZED ON THIS DRAWING ARE IAW ASME Y14.38, EXCEPT:
BKSHL = BACKSHELL
STRLF = STRAIN RELIEF

NEW, MODIFIED, OR OVERHAULED MACHINERY, EQUIPMENT AND COMPONENTS AFFECTED BY THIS INSTALLATION SHALL MEET THE NOISE AND VIBRATION REQUIREMENTS OF

NAMEPLATES, SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH MIL-DTL-15024 AND THIS DRAWING. ATTACH TO RESPECTIVE EQUIPMENT USING DOUBLE-SIDED TAPE (3M Y9122) OR ADHESIVE PER MIL-A-22986.

ELECTRICAL AND ELECTRONIC DESIGNATION AND MARKING SHALL BE IAW OF SEC 305

MATERIAL SOURCE INDICATIONS SHOWN IN SOURCE COLUMN ARE AS FOLLOWS:
IAF - INSTALLING ACTIVITY FURNISHED
GFM - GOVERNMENT FURNISHED MATERIAL

THE ORDER OF PRECEDENCE FOR PROCURING ELECTRICAL CABLES SHALL BE MIL-C-24640, THEN MIL-C-24643. MIL-C-24640 CABLE SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH PUBLISHED NAVSEA STANDARDS AND ANY DEVIATION SHALL REQUIRE APPROVAL. MIL-HDBK-299 SHALL BE USED FOR GUIDANCE IN

ALL CABLES ARE TO BE ROUTED LOCALLY BY THE INSTALLING ACTIVITY USING METHODS DESCRIBED IN DOD-STD-2003 (NAVY).

NEW MATERIAL AND EQUIPMENT AFFECTED BY THIS INSTALLATION SHALL BE PREPARED AND PAINTED IAW NAVAL SHIPS TECHNICAL MANUAL, NAVSEA S9066-VD-STM-000/CH31, AND SECTION 631 OF NAVSEA S9AA0-AB-GOS-010/GSO.

ALL CABLE AND EQUIPMENT ARE NEW UNLESS OTHERWISE INDICATED.

ALL EXISTING EQUIPMENT IS SHOWN BY DASHED LINES (- - - -).
ALL NEW AND RELOCATED EQUIPMENT IS SHOWN BY SOLID LINES (———).

ALL ELECTRICAL EQUIPMENT AND CABLES, EXCEPT CABLES AND EQUIPMENT ASSOCIATED WITH SECURE PROCESSING EQUIPMENT OR LOCATED IN SECURE SPACES, SHALL BE BONDED AND GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 406 OF NAVSEA S9AA-AB-GOS-010/GSO AND MIL-STD-1310 AS MODIFIED BY OD32382.

ALL ELECTRICAL EQUIPMENT AND CABLES ASSOCIATED WITH SECURE PROCESSING OR LOCATED IN SECURE SPACES SHALL BE INSTALLED, INCLUDING BONDING AND GROUNDING, IN ACCORDANCE WITH SECTION 402 OF NAVSEA S9AA0-AB-GOS-010/GSO EXCEPT THAT THE DEPT OF THE NAVY IA PUB-5239-31 (JUNE 2000 EDITION) USED IN CONJUNCTION WITH NSTISSAM TEMPEST/2-95, RED/BLACK INSTALLATION GUIDANCE SHALL BE USED IN LIEU OF MIL-STD-1680.

ITEMS WILL BE REMOVED/RELOCATED AND/OR RETAINED BY SPAWAR PROGRAM OFFICE OR ISEA PERSONNEL, OR THEIR DESIGNEE, AS DIRECTED AND STORED AT AN OFF-SHIP LOCATION FOR RE-INSTALLATION UPON REMOVAL OF TEMPALT.

FIBER OPTIC CABLE ENTRANCE INTO EQUIPMENT MAY EMPLOY THE SAME DEVICES (I.E. STUFFING TUBES, CABLE CLAMPS) USED FOR ELECTRIC CABLE ENTRANCE INTO EQUIPMENT. METHODS UNIQUE TO FIBER OPTIC CABLE OR THAT DIFFER

LIST OF MATERIAL (QUANTITY FOR ONE SHIP)

ITEM NO.	QTY RQD	DESCRIPTION	MTL SPEC	MTL REQ	NSN OR MFGR PART NO.	SCE	APL NO.	UNIT WT.	REMARKS
1	2	1RU PDA W/ CABLES	–	–	112-32500	2 GFM	00042434	15.75	SAIC, PWR DISTR ASSY
2	1	1RU SCSI EXPANSION CHASSIS	–	–	168-32000 (65-32132-1)	1 GFM	00044201	7.3	SAIC
3	2	WORKSTATION CENTER, NEPTUNE	–	–	136-32602	2 GFM	00042257	45.0	SAIC
4	7	J6000 W/RACKMOUNT	–	–	A5990A	7 GFM	–	48.0	HEWLETT PACKARD
5	1	JBOD DS2100, DISK SYSTEM	–	–	A5675A	1 GFM	–	17.89	HEWLETT PACKARD
6	1	COMPUTER, SUN RAVE (RADIANT MERCURY)	–	–	M/N: RM2DIA-AX1105	1 GFM	–	22.0	RAVE
7	3	1RU PC SERVER	–	–	V133-1126	3 GFM	–	–	VISION
8	1	SWITCH, SCI	–	–	OS-4024CF	1 GFM	–	8.0	ALCATEL
9	7	J6000, WORKSTATION	–	–	–	7 GFM	–	37.5	HEWLETT PACKARD
10	2	MEDIA CONVERTER CHASSIS	–	–	MIL-9100X	2 GFM	–	6.0	MILAN
11	3	SWITCH, 1 X 8, FIBER TO RJ-45	–	–	MIL-S801PSCxx	3 GFM	–	–	–
12	16	MEDIA CONVERTER, 100 BASE-T TO 100 BASE-FL	–	–	MIL-C102RM	16 GFM	–	–	MILAN P/O ITEM 10
13	2	MEDIA CONVERTER, REDUNDANT POWER SUPPLY	–	–	MIL-9000PSAC	2 GFM	–	–	MILAN P/O ITEM 10
14	10	Y-MOUSE	–	–	WHYM-008	10 GFM	–	–	SAIC
15	7	ROUTER	–	–	CISCO2621-DC	7 IAF	–	8.85	CISCO

CONTINUED ON SHEET 7

TEST NOTES

T-1. FIBER OPTIC CABLE INSTALLED FOR THIS TEMPALT SHALL BE TESTED PER MIL STANDARD: 2042-FIBER OPTIC TOPOLOGY INSTRUCTIONS-STANDARD METHODS FOR NAVAL SHIPS.

T-2. UPON COMPLETION OF THE INSTALLATION, A VISUAL "TEMPEST" CONFIGURATION CONTROL INSPECTION MUST BE CONDUCTED BY A CERTIFIED TEMPEST TECHNICAL AUTHORITY (CTTA) TO ENSURE COMPLIANCE WITH THE REQUIREMENTS OF NSTISSAM TEMPEST/2-95, RED/BLACK INSTALLATION GUIDANCE ALONG WITH THE INFORMATION ASSURANCE SHIPBOARD RED/BLACK INSTALLATION PUBLICATION (MODULE 5239-31).

REVISIONS

REV	ZONE	DESCRIPTION	BY	DATE	APPROVED

WEIGHT CONTROL DATA

REV	SHIPALT NUMBER	WT GP	WT (LBS)	I R XI OR XR	VCG REF BL	LCG REF III	F OR A	TCG REF CL	P S OR O	VAL BY
–	TA134	413	1183	I	50.44	7.6	F	22.5	P	DFV

LEVERS IN FEET TO THE NEAREST TENTH OF A FOOT
USE SEPARATE LINES FOR EACH WT GRP. S/A, REV, WT INSTL, WT RMV
I=INSTALL R=REMOVE XI=LOAD ITEM INSTALLED XR= LOAD ITEM REMOVED
F=FWD A=AFT P=PORT S=STBD O=C

REFERENCES

NO.	HULL	TITLE	IDENT
3	LCC-19	TEMPALT OED TA134 LCC-19 USS BLUE RIDGE MOD TO ARR	53711-413-7616246
2	LCC-19	TEMPALT OED TA134 LCC-19 USS BLUE RIDGE CABLE RUNNING SHEETS	53711-413-7616248
1	STD	GENERAL SPECIFICATIONS FOR OVERHAUL OF SURFACE SHIPS (GSO) (2000 EDITION)	S9AA0-AB-GOS-010/GSO

THIS DRAWING MODIFIES NO KNOWN DRAWING.

DIMENSIONAL TOLERANCES - UNLESS OTHERWISE SPECIFIED

DIMENSION (IN)	DECIMAL 2 PL	DECIMAL 3 PL	FRACTION
UNDER 6	±.010	±.005	±1/64
6 TO 24	±.020	±.010	±1/32
OVER 24	±.030	±.015	±1/16

FILLETS & RADII TO BE 1/8
TOL ON ANGLES ±0-30'

SYMBOL	GEOMETRY	TOLERANCE
⏥	FLATNESS	.0005 /IN
⊥	PERPENDICULAR	.001 /IN
//	PARALLELISM	.001 /IN
◎	CONCENTRICITY	AS NOTED
—	STRAIGHTNESS	.0005 /IN

SYM IAW ANSI Y14.5M-1982

REVISION STATUS OF SHEETS: 1 2 3 4 5 6 7 (– – – – – – –)

SHIP APPLICABILITY

SHIP	REV	SHIPCK BY	DT
LCC-19	–	–	/

CONTRACT NO. GS00T99ALD00210 FSCM NO. 4T323
AMSEC LLC
2829 GUARDIAN LANE
VIRGINIA BEACH, VA 23452-7328

PREPARED R. SOBLOTNE DATE 05/20/03
CHECKED D. MCKAY 05/20/03 PMW 157
ENGINEER T. GILCHRIST 05/20/03 PMW 157-MLS
APPROVED T. GILCHRIST 05/20/03 PMW 157-1F J. FALBO
AUTHORITY:

SPAWARSYSCEN SAN DIEGO
53560 HULL STREET
SAN DIEGO, CA
92152-5001

ACCEPTED FOR NAVSEA
APPROVED BY NAVSEA

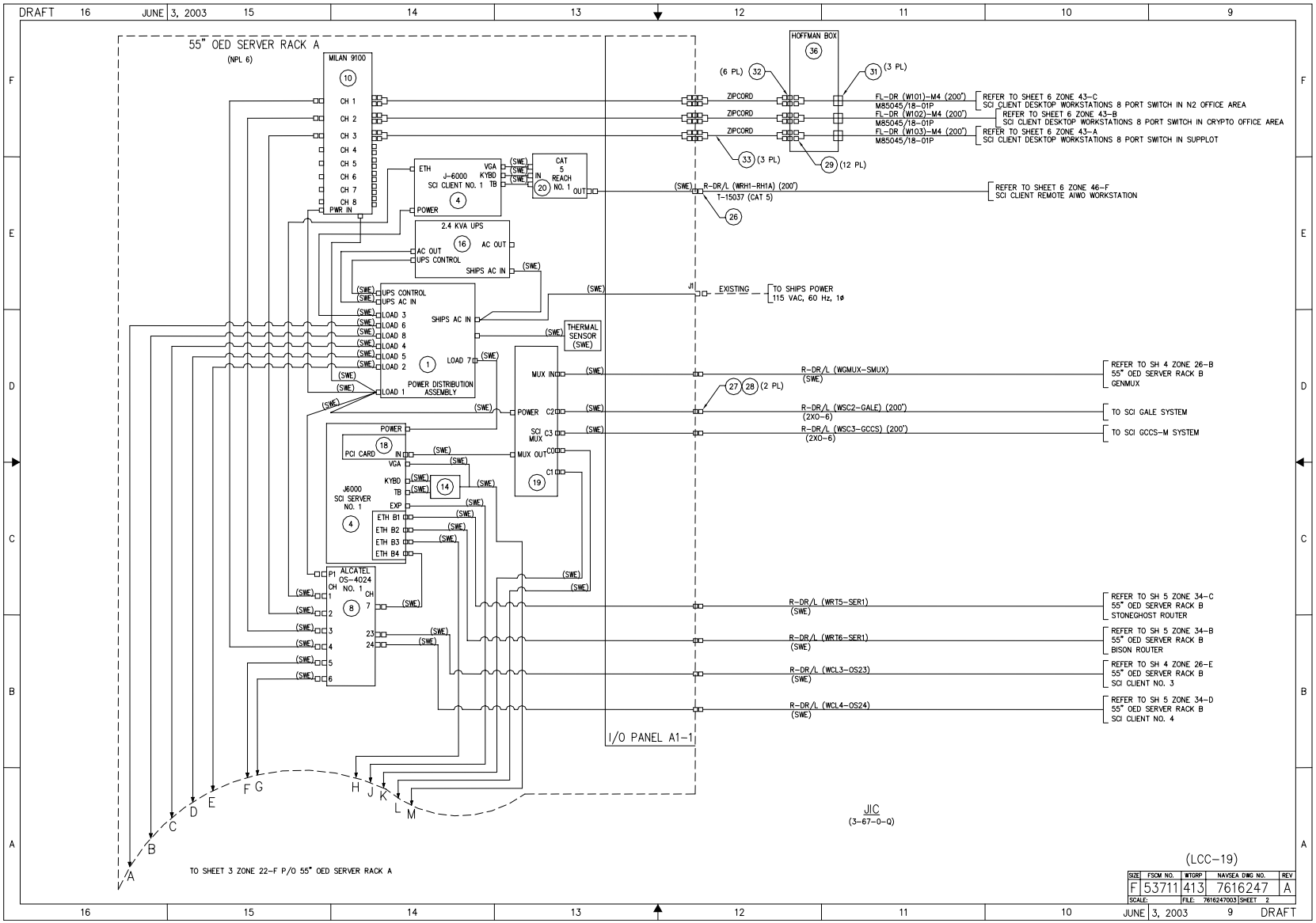
DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON NAVY YARD, D.C. 20376-7012

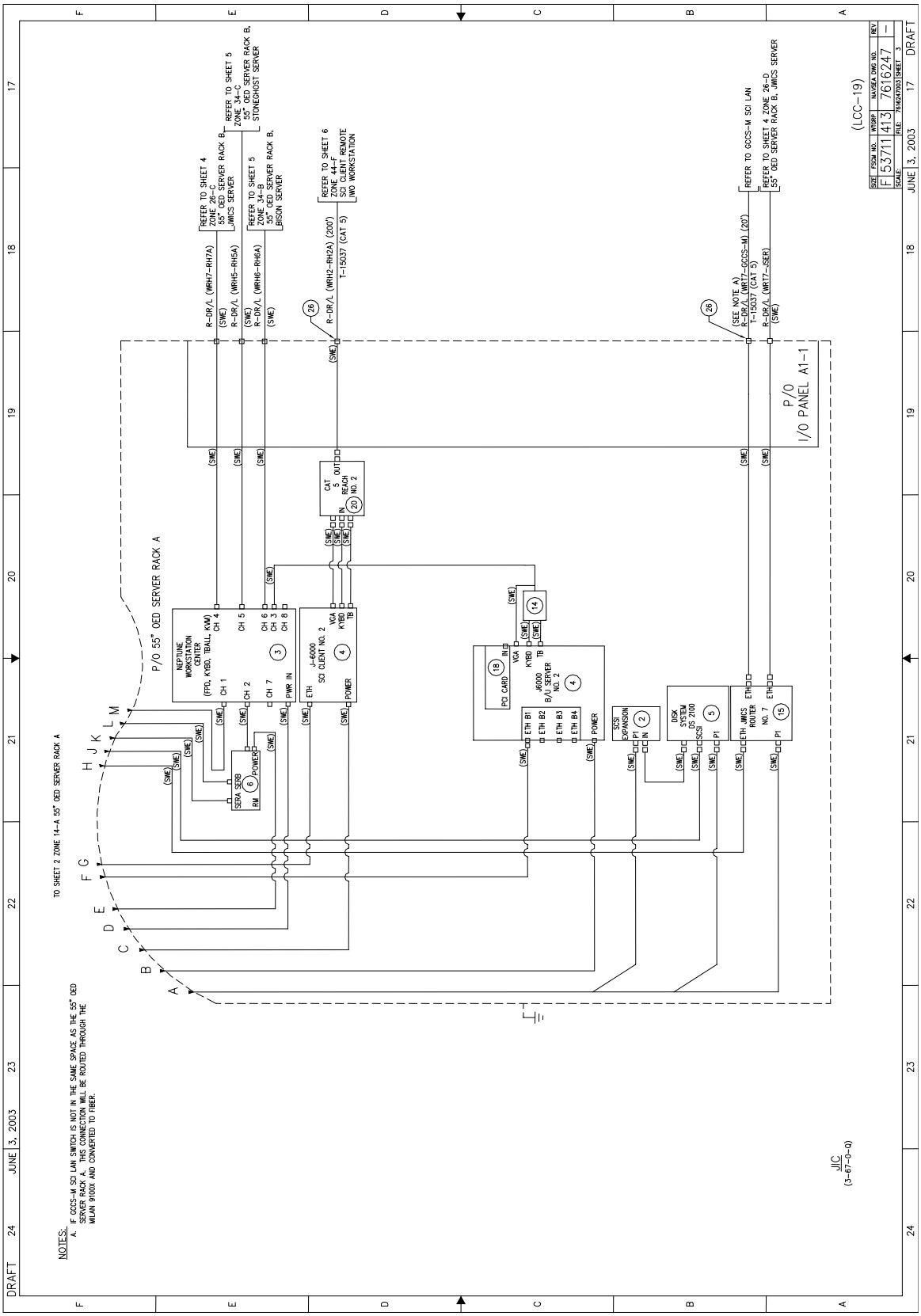
TEMPALT OED
TA134 LCC-19
USS BLUE RIDGE
MOD TO BLK WRG DIAG

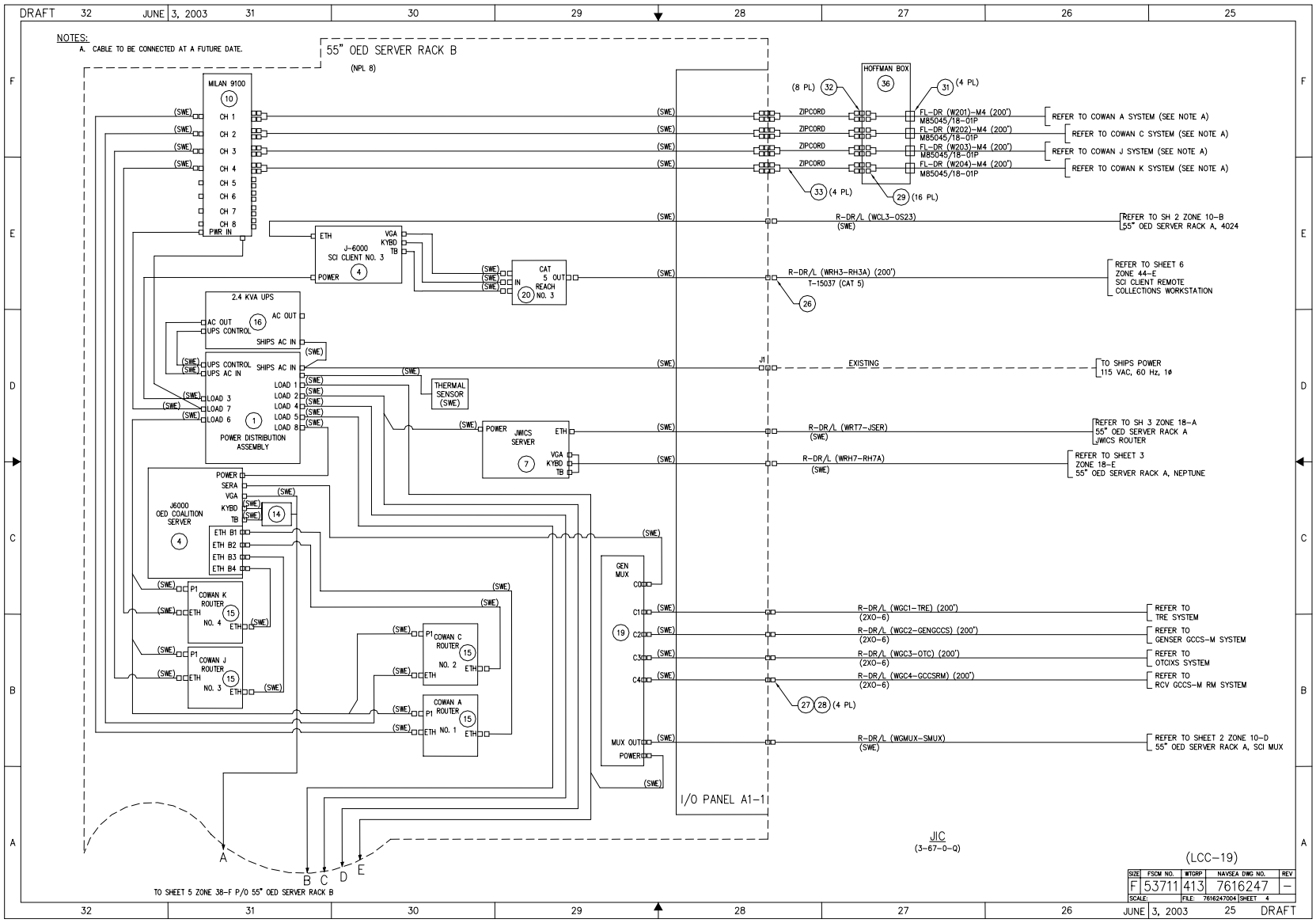
SIZE	FSCM NO.	WTGRP	NAVSEA DRAWING NO.	REV
F	53711	413	7616247	–

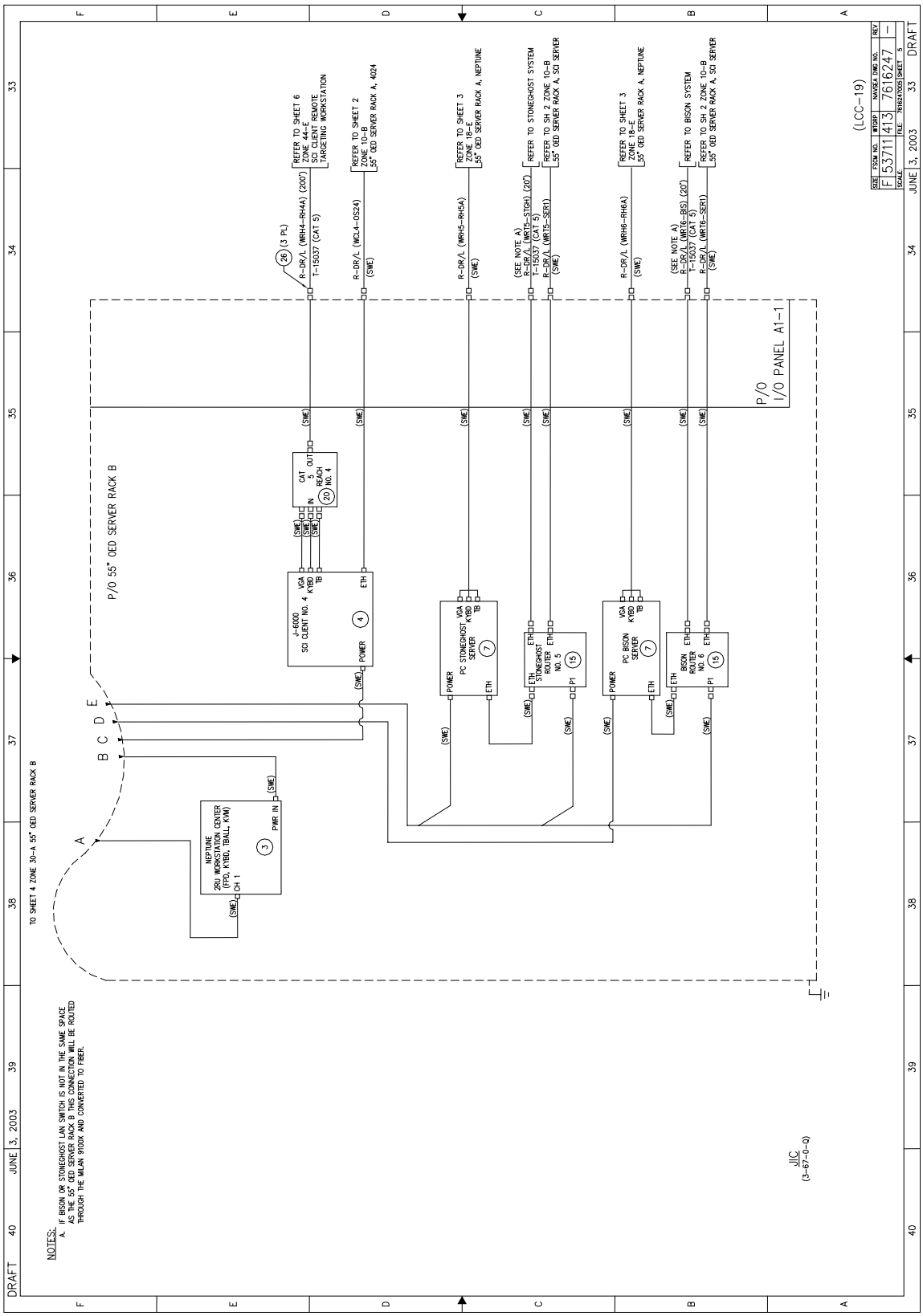
SCALE: AS SHOWN FILE: 7616247001 SHEET 1 OF 7

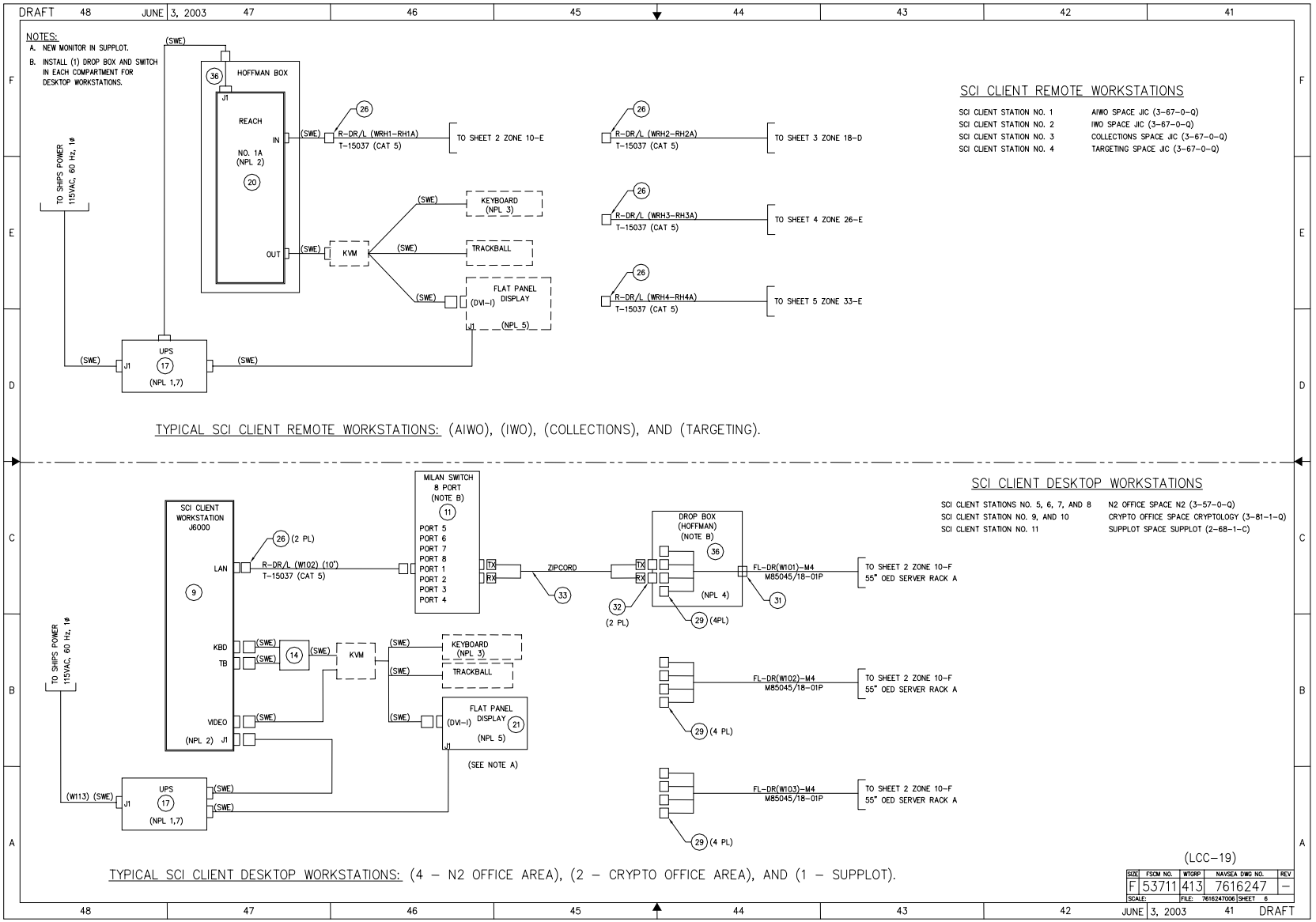
JUNE 3, 2003 DRAFT


DRAFT
JUNE 3, 2003
55" OED SERVER RACK A
(NPL 6)
MILAN 9100
CH 1
CH 2
CH 3
CH 4
CH 5
CH 6
CH 7
CH 8
PWR IN
HOFFMAN BOX
ZIPCORD
FL-DR (W101)-M4 (200')
M85045/18-01P
REFER TO SHEET 6 ZONE 43-C
SCI CLIENT DESKTOP WORKSTATIONS 8 PORT SWITCH IN N2 OFFICE AREA
FL-DR (W102)-M4 (200')
REFER TO SHEET 6 ZONE 43-B
SCI CLIENT DESKTOP WORKSTATIONS 8 PORT SWITCH IN CRYPTO OFFICE AREA
FL-DR (W103)-M4 (200')
REFER TO SHEET 6 ZONE 43-A
SCI CLIENT DESKTOP WORKSTATIONS 8 PORT SWITCH IN SUPPLOT
J-6000 SCI CLIENT NO. 1
CAT 5 REACH NO. 1
R-DR/L (WRH1-RH1A) (200')
T-15037 (CAT 5)
REFER TO SHEET 6 ZONE 46-F
SCI CLIENT REMOTE AIWO WORKSTATION
2.4 KVA UPS
SHIPS AC IN
EXISTING
TO SHIPS POWER
115 VAC, 60 Hz, 1ø
THERMAL SENSOR (SWE)
POWER DISTRIBUTION ASSEMBLY
R-DR/L (WGMUX-SMUX)
REFER TO SH 4 ZONE 26-B
55" OED SERVER RACK B
GENMUX
R-DR/L (WSC2-GALE) (200')
TO SCI GALE SYSTEM
R-DR/L (WSC3-GCCS) (200')
TO SCI GCCS-M SYSTEM
J6000 SCI SERVER NO. 1
ALCATEL OS-4024 CH NO. 1
R-DR/L (WRT5-SER1)
REFER TO SH 5 ZONE 34-C
55" OED SERVER RACK B
STONEGHOST ROUTER
R-DR/L (WRT6-SER1)
REFER TO SH 5 ZONE 34-B
55" OED SERVER RACK B
BISON ROUTER
R-DR/L (WCL3-OS23)
REFER TO SH 4 ZONE 26-E
55" OED SERVER RACK B
SCI CLIENT NO. 3
R-DR/L (WCL4-OS24)
REFER TO SH 5 ZONE 34-D
55" OED SERVER RACK B
SCI CLIENT NO. 4
I/O PANEL A1-1
JIC
(3-67-0-Q)
TO SHEET 3 ZONE 22-F P/O 55" OED SERVER RACK A
(LCC-19)
SIZE F
FSCM NO. 53711
WTGRP 413
NAVSEA DWG NO. 7616247
REV A
SCALE:
FILE: 7616247003
SHEET 2


DRAFT
JUNE 3, 2003
NOTES:
A. IF GCCS-M SCI LAN SWITCH IS NOT IN THE SAME SPACE AS THE 55" QED SERVER RACK A, THIS CONNECTION WILL BE ROUTED THROUGH THE MILAN 9100A AND CONVERTED TO FIBER.
TO SHEET 2 ZONE 14-A 55" QED SERVER RACK A
P/O 55" QED SERVER RACK A
NEPTUNE WORKSTATION CENTER (FPD, KYBD, TBALL, KVM)
J-6000 SCI CLIENT NO. 2
SERA SEB
POWER
PWR IN
CAT 5 OUT
REACH NO. 2
PCI CARD
J6000 B/A SERVER NO. 2
ETH B1
ETH B2
ETH B3
ETH B4
SCSI EXPANSION PCI
DISK SYSTEM DS 2100
ETH JWICS ROUTER NO. 7
R-DR/L (WRH7-RH7A)
R-DR/L (WRH5-RH5A)
R-DR/L (WRH6-RH6A)
R-DR/L (WRH2-RH2A) (200')
T-15037 (CAT 5)
R-DR/L (WR17-GCCS-M) (20')
R-DR/L (WR17-JSER)
REFER TO SHEET 4 ZONE 26-C 55" QED SERVER RACK B, JWICS SERVER
REFER TO SHEET 5 ZONE 34-C 55" QED SERVER RACK B, STONEGHOST SERVER
REFER TO SHEET 5 ZONE 34-B 55" QED SERVER RACK B, BISON SERVER
REFER TO SHEET 6 ZONE 44-F SCI CLIENT REMOTE JWO WORKSTATION
REFER TO GCCS-M SCI LAN
REFER TO SHEET 4 ZONE 26-D 55" QED SERVER RACK B, JWICS SERVER
P/O I/O PANEL A1-1
(LCC-19)
JUC (3-67-0-q)
SIZE F
FSCM NO. 53711
MYDRP 413
NAVSEA DWG NO. 7616247
REV -
SCALE:
FILE: 7616247D03
SHEET 3
JUNE 3, 2003
DRAFT


DRAFT
JUNE 3, 2003
NOTES:
A. CABLE TO BE CONNECTED AT A FUTURE DATE.
55" OED SERVER RACK B
(NPL 8)
MILAN 9100
CH 1
CH 2
CH 3
CH 4
CH 5
CH 6
CH 7
CH 8
PWR IN
HOFFMAN BOX
ZIPCORD
FL-DR (W201)-M4 (200')
M85045/18-01P
FL-DR (W202)-M4 (200')
FL-DR (W203)-M4 (200')
FL-DR (W204)-M4 (200')
REFER TO COWAN A SYSTEM (SEE NOTE A)
REFER TO COWAN C SYSTEM (SEE NOTE A)
REFER TO COWAN J SYSTEM (SEE NOTE A)
REFER TO COWAN K SYSTEM (SEE NOTE A)
J-6000
SCI CLIENT NO. 3
ETH
VGA
KYBD
TB
POWER
CAT 5 REACH NO. 3
R-DR/L (WCL3-OS23)
REFER TO SH 2 ZONE 10-B
55" OED SERVER RACK A, 4024
R-DR/L (WRH3-RH3A) (200')
T-15037 (CAT 5)
REFER TO SHEET 6
ZONE 44-E
SCI CLIENT REMOTE
COLLECTIONS WORKSTATION
2.4 KVA UPS
AC OUT
UPS CONTROL
SHIPS AC IN
POWER DISTRIBUTION ASSEMBLY
LOAD 1
LOAD 2
LOAD 3
LOAD 4
LOAD 5
LOAD 6
LOAD 7
LOAD 8
THERMAL SENSOR
J1
EXISTING
TO SHIPS POWER
115 VAC, 60 Hz, 1ø
JWICS SERVER
R-DR/L (WRT7-JSER)
REFER TO SH 3 ZONE 18-A
55" OED SERVER RACK A
JWICS ROUTER
R-DR/L (WRH7-RH7A)
REFER TO SHEET 3
ZONE 18-E
55" OED SERVER RACK A, NEPTUNE
J6000
OED COALITION SERVER
SERA
ETH B1
ETH B2
ETH B3
ETH B4
COWAN K ROUTER NO. 4
COWAN J ROUTER NO. 3
COWAN C ROUTER NO. 2
COWAN A ROUTER NO. 1
GEN MUX
C0
C1
C2
C3
C4
MUX OUT
R-DR/L (WGC1-TRE) (200')
(2XO-6)
REFER TO
TRE SYSTEM
R-DR/L (WGC2-GENGCCS) (200')
REFER TO
GENSER GCCS-M SYSTEM
R-DR/L (WGC3-OTC) (200')
REFER TO
OTCIXS SYSTEM
R-DR/L (WGC4-GCCSRM) (200')
REFER TO
RCV GCCS-M RM SYSTEM
R-DR/L (WGMUX-SMUX)
REFER TO SHEET 2 ZONE 10-D
55" OED SERVER RACK A, SCI MUX
I/O PANEL A1-1
JIC
(3-67-0-Q)
(LCC-19)
TO SHEET 5 ZONE 38-F P/O 55" OED SERVER RACK B
SIZE F
FSCM NO. 53711
WTGRP 413
NAVSEA DWG NO. 7616247
REV -
SCALE:
FILE 7616247004
SHEET 4


DRAFT
JUNE 3, 2003
P/O 55" OED SERVER RACK B
P/O I/O PANEL A1-1
NEPTUNE WORKSTATION CENTER (FPD, KYBD, TBALL, KVM)
J-6000 SGI CLIENT NO. 4
PC STONEGHOST SERVER
STONEGHOST ROUTER NO. 5
PC BISON SERVER
BISON ROUTER NO. 6
R-DR/L (WRH4-RH4A) (200')
R-DR/L (WC14-0524)
R-DR/L (WRH5-RH5A)
R-DR/L (WRT5-STGH) (20')
R-DR/L (WRT5-SER1)
R-DR/L (WRH6-RH6A)
R-DR/L (WRT6-BIS) (20')
R-DR/L (WRT6-SGR1)
REFER TO SHEET 6 ZONE 44-E SGI CLIENT REMOTE TARGETING WORKSTATION
REFER TO SHEET 2 ZONE 10-B 55" OED SERVER RACK A, 4024
REFER TO SHEET 3 ZONE 19-E 55" OED SERVER RACK A, NEPTUNE
REFER TO STONEGHOST SYSTEM
REFER TO SH 2 ZONE 10-B 55" OED SERVER RACK A, SGI SERVER
REFER TO SHEET 3 ZONE 18-E 55" OED SERVER RACK A, NEPTUNE
REFER TO BISON SYSTEM
REFER TO SH 2 ZONE 10-B 55" OED SERVER RACK A, SGI SERVER
TO SHEET 4 ZONE 30-A 55" OED SERVER RACK B
NOTES:
A. IF BISON OR STONEGHOST LAN SWITCH IS NOT IN THE SAME SPACE AS THE 55" SGI SERVER RACK B THIS CONNECTION WILL BE ROUTED THROUGH THE MILAN 9100X AND CONVERTED TO FIBER.
JIC (3-67-0-0)
(LCC-19)
SIZE F
FSCM NO. 53711
MTORP 4413
NAVSEA DWG NO. 7616247
REV -
SCALE
FILE: 7616247005 SHEET 5
JUNE 3, 2003
DRAFT

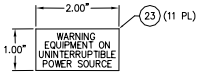

DRAFT
JUNE 3, 2003
NOTES:
A. NEW MONITOR IN SUPPLOT.
B. INSTALL (1) DROP BOX AND SWITCH IN EACH COMPARTMENT FOR DESKTOP WORKSTATIONS.
HOFFMAN BOX
REACH
NO. 1A (NPL 2)
IN
OUT
KVM
KEYBOARD (NPL 3)
TRACKBALL
FLAT PANEL DISPLAY
(DVI-I)
(NPL 5)
UPS
(NPL 1,7)
TO SHIPS POWER 115VAC, 60 Hz, 1Ø
R-DR/L (WRH1-RH1A) T-15037 (CAT 5)
TO SHEET 2 ZONE 10-E
R-DR/L (WRH2-RH2A) T-15037 (CAT 5)
TO SHEET 3 ZONE 18-D
R-DR/L (WRH3-RH3A) T-15037 (CAT 5)
TO SHEET 4 ZONE 26-E
R-DR/L (WRH4-RH4A) T-15037 (CAT 5)
TO SHEET 5 ZONE 33-E
SCI CLIENT REMOTE WORKSTATIONS
SCI CLIENT STATION NO. 1 AIWO SPACE JIC (3-67-0-Q)
SCI CLIENT STATION NO. 2 IWO SPACE JIC (3-67-0-Q)
SCI CLIENT STATION NO. 3 COLLECTIONS SPACE JIC (3-67-0-Q)
SCI CLIENT STATION NO. 4 TARGETING SPACE JIC (3-67-0-Q)
TYPICAL SCI CLIENT REMOTE WORKSTATIONS: (AIWO), (IWO), (COLLECTIONS), AND (TARGETING).
SCI CLIENT WORKSTATION J6000
MILAN SWITCH 8 PORT (NOTE B)
PORT 5
PORT 6
PORT 7
PORT 8
PORT 1
PORT 2
PORT 3
PORT 4
LAN
KBD
TB
VIDEO
R-DR/L (W102) (10') T-15037 (CAT 5)
ZIPCORD
DROP BOX (HOFFMAN) (NOTE B)
(NPL 4)
FL-DR(W101)-M4 M85045/18-01P
FL-DR(W102)-M4 M85045/18-01P
FL-DR(W103)-M4 M85045/18-01P
TO SHEET 2 ZONE 10-F 55" OED SERVER RACK A
(SEE NOTE A)
SCI CLIENT DESKTOP WORKSTATIONS
SCI CLIENT STATIONS NO. 5, 6, 7, AND 8 N2 OFFICE SPACE N2 (3-57-0-Q)
SCI CLIENT STATION NO. 9, AND 10 CRYPTO OFFICE SPACE CRYPTOLOGY (3-81-1-Q)
SCI CLIENT STATION NO. 11 SUPPLOT SPACE SUPPLOT (2-68-1-C)
TYPICAL SCI CLIENT DESKTOP WORKSTATIONS: (4 – N2 OFFICE AREA), (2 – CRYPTO OFFICE AREA), AND (1 – SUPPLOT).
(LCC-19)
SIZE F FSCM NO. 53711 WTGRP 413 NAVSEA DWG NO. 7616247 REV –
SCALE: FILE: 7616247006 SHEET 6
JUNE 3, 2003 DRAFT

NOTES:

A. NUMBERS ON NPL WILL BE DETERMIND BY ASSIGNED RACK OR WORKSTATION.

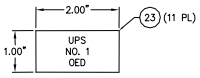
LIST OF MATERIAL (QUANTITY FOR ONE SHIP)

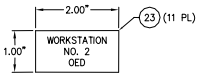
ITEM NO.	QTY RQD	DESCRIPTION	MTL SPEC	MTL REQ	NSN OR MFGR PART NO.	SCE	APL NO.	UNIT WT.	REMARKS
16	2	UPS	–	–	UPSI-2.4K-1G-SRNDTI-J3	2 GFM	–	101.0	NOVA POWER
17	11	UPS	–	–	SUA1500X93	11 GFM	–	93.0	APC
18	2	STT-64/128P PCI CARD	–	–	A6749A	2 GFM	–	–	EQUINOX/HP
19	2	PM16-DB 16 PORT MUX	–	–	990245	2 GFM	–	15.85	EQUINOX
20	4	CAT 5 REACH	–	–	USBED	4 IAF	–	–	RARITAN
21	1	FLAT PANEL DISPLAY	–	–	LCD 1850X	1 GFM	–	–	NEC (10 EXISTING MONITORS)
22	1200'	CABLE, 2X0-6	MIL-C-24640/12		6145-01-225-2196	1200' IAF	–	–	–
23	60	NAMEPLATE, TYPE H	MIL-DTL-15024	AL	–	60 IAF	–	–	SEE GN 9
24	–	RESERVED	–	–	–	– –	–	–	–
25	–	RESERVED	–	–	–	– –	–	–	–
26	25	CONNECTOR, RJ-45 SHIELDED		–	95043-5891	25 IAF	–	–	MOLEX
27	6	CONNECTOR, DB-25 MALE	–	–	M24308/4-3	6 IAF	–	–	–
28	6	BACKSHELL, DB-25	–	–	KDM002-25CD4J	6 IAF	–	–	–
29	40	CONNECTOR, FIBER ST	–		M83522/16-CNX	40 IAF	–	–	–
30	–	RESERVED	–	–	–	– –	–	–	–
31	10	CONNECTOR, FLEXABLE CORD	–	–	3302	10 IAF	–	–	THOMAS AND BETTS
32	20	COUPLING, FIBER OPTIC, ST	–	–	M83522/17-NX	20 IAF	–	–	–
33	10	ASSEMBLY, CABLE FIBER OPTIC ST TO ST		–	349574-3	10 IAF	–	–	AMP
34	1400'	CABLE, FIBER OPTIC	–	–	M85045/18-01P	1400' IAF	–	–	–
35	870'	CABLE, CAT 5	–	–	T-15037	870' IAF	–	–	–
36	9	HOFFMAN BOX	–	–	5975-01-083-9642	9 IAF	–	–	–

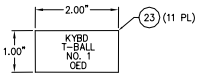


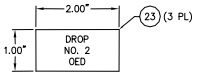
DETAIL 48-D

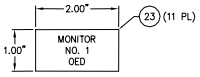
POWER WARNING NAMEPLATES
PHOTOSENSITIVE ALUMINUM
NATURAL LETTERS ON RED BACKGROUND
LETTERS SIZED TO SUIT
PLACE ON FRONT PANEL OF EQUIPMENT

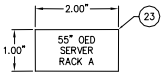


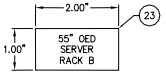












DETAIL 52-A

PHOTOSENSITIVE ALUMINUM
BLACK LETTERS ON SILVER BACKGROUND
LETTERS SIZED TO SUIT
PLACE ON FRONT PANEL OF EQUIPMENT

(LCC-19)

SIZE	FSCM NO.	WTGRP	NAVSEA DWG NO.	REV
F	53711	413	7616247	–
SCALE:			FILE: 7616247007 SHEET 7	

APPENDIX E: OED TEMPALT ILS CERTIFICATION

ADDENDUM Number:	Revision Date:
Date ILS Certification Form prepared: 05 May 2003	
If revised, date and revision number of this ILS Certification form (DD MMM YYYY)/Rev #:	
ILS Certification Form for Alteration Number(s): TA0000K (LCC 19 – USS Blue Ridge) **Alteration Type:** TEMPALT	
Alteration Title and/or Brief: OSIS (Ocean Surveillance Information System) Evolutionary Development (OED)	
Purpose of this Alteration: Proof of concept for multilevel security (MLS) Afloat.	
Equipment Nomenclature(s) and AML #: No T/A For PROTOTYPE SYSTEM	
ILS Impact? (Yes or No): Yes	

SUPPLY SUPPORT REQUIREMENTS

A. SUPPORT REQUIREMENTS
Responsible Activity, Name, Code, Telephone Number and E-mail Address: Maureen Myer, 619-553-3979, myer@spawar.navy.mil
1. COTS / NDI? (Yes or No): **Yes**
2. PTD Procured or Developed? (Yes or No): **No**
a. If yes, date submitted to TSA/NAVICP:
b. If no, provide a brief rationale and/or estimated completion date: **T/A For PROTOTYPE SYSTEM**
c. TSA/NAVICP Point of Contact (Name, Code, Phone and E-mail Address):
3. PAL Established? (Yes or No): **No**
4. Have you planned for procurement of parts to replenish shipboard spares? (Yes or No): **No**
5. Has PSD information been provided to NAVSEA 04 for inclusion in PARTS? (Yes or No): **No**
a. If yes, date provided (DD MMM YYYY):
b. Has the installation schedule in PARTS been maintained? (Yes or No):
c. If no, to question 5, provide a brief rationale and/or estimated completion date: **T/A For PROTOTYPE SYSTEM**
6. T &C (INCO) Kits required? (Yes or No): **No**
7. Are there Intermediate and Depot level support requirements? (Yes or No): **No**
a. If yes, has the identification and transfer of all required equipment assemblies, parts, tools, test and support equipment to maintenance facilities been completed? (Yes or No):
b. If no, to question 7a, provide the date for the completion of these requirements. (DD MMM YYYY):
c. Provide name, code, telephone number and E-mail Address for Intermediate/Depot level maintenance requirements:

B. CONFIGURATION IDENTIFICATION
Responsible Activity, Name, Code, Telephone Number and E-mail Address: Maureen Myer, 619-553-3979, myer@spawar.navy.mil
1. Has configuration data been loaded in CDMD-OA? (Yes or No): **No**
a. If not, provide the date when the data will be loaded. (DD MMM YYYY): Note: configuration data must be loaded in CDMD-OA NLT 2 months prior to Installation.
b. If data is not being provided via CDMD-OA, provide a brief justification: **T/A For PROTOTYPE SYSTEM**
2. Is software included in this alteration? (Yes or No): **Yes** Software Version/Date: **OSTK-SW-AR-4.1**

SID # / SID ITEM #	AML Item #	ACL / APL / PAL / AEL Number	NSN or Cage / Part Number	Equipment Identification	MSD / PBL	Hull(s) Applicability
		Note 1	Cage: 61099 P/N: 112-32500 NSN: 7GH5895-LL-H7A-7991	1RU PDA w/ cables (Power Distribution Unit)		LCC 19
		Note 1	Cage: 61099 P/N: 168-32000 NSN:0UH5975-LL-H7A-9794	1RU SCSI Expansion Chassis		LCC 19
		Note 1	Cage: 61099 P/N: 136-32000 7GH5895-LL-H7A-7298	Neptune Flat Panel Display		LCC 19
		Note 1	Cage: 29355 P/N: A5990A NSN: 0UH5975-LL-H7A-9586	Server Non Rugged HP-J6000 Rackmount		LCC 19
		Note 1	Cage: 29355 P/N: A5990A NSN: 0UH5975-LL-H7A-9586	Server Non Rugged HP-J6000 Desktop		LCC 19
		Note 1	P/N: A5675A NSN: 9Z 5975-01-497-1653	JBOD DS2100		LCC 19
		Note 1	P/N: RM2DIA-AX1105	Radiant Mercury - Sun Rave		LCC 19
		Note 1	P/N: V133-1126	1RU PC Server		LCC 19
		Note 1	P/N: OS-4024CF	Switch , SCI		LCC 19
		Note 1	Cage: 0UEA8 P/N: MIL-9100X NSN: 9G 5975-01-440-5561	Chassis, Media Converter, 8 port, Milan		LCC 19
		Note 1	Cage: 0UEA8 P/N: MIL-140 TRM NSN: 1HM5895-01-506-7511	Module Converter, 10BaseT-10Base-FL		LCC 19

SID # / SID ITEM #	AML Item #	ACL / APL / PAL / AEL Number	NSN or Cage / Part Number	Equipment Identification	MSD / PBL	Hull(s) Applicability
		Note 1	Cage: 0UEA8 P/N MIL-C102RM NSN: 1HM5895-01-506-7550	Media Converter, 100Base-T to 100Base-FL		LCC 19
		Note 1	Cage: 0UEA8 P/N MIL-9000PSAC NSN: 1HM6130-01-506-7490	Media Converter, Redundant Power Supply		LCC 19
		Note 1	P/N MIL-S801PSCxx	Switch, 8-port, Fiber UPLINK		LCC 19
		Note 1	P/N: CISCO2621-DC	Router, CISCO		LCC 19
		Note 1	Cage: 1BCN7 P/N: UPS1-2.4K-1G-SRNDT1-J3	2.4 KVA UPS CLARY		LCC 19
		Note 1	Cage: 0MG77 P/N: SUA1500X93 NSN: 0UH6130-LL-H7B-0456	UPS Smart APC 1500		LCC 19
		Note 1	P/N: A6749A	SST-64/128P		LCC 19
		Note 1	P/N: 990245 NSN: 9N 5985-01-368-8958	PM16-DB-16 Port PCI MUX		LCC 19
		Note 1	Cage: 0JCP9 P/N: UPCED NSN: 1HM0099-LL-H7B-0533	Cat-5 Reach Unit (UPCED Kit KVM CAT5 PC)		LCC 19
		Note 1	P/N: LCD1850X NSN: 7GH5895-01-498-5023	Flat Panel Display		LCC 19
		Note 1	P/N: L465-BK	Flat Panel Display		LCC 19
		Note 1	P/N: WHYM-0008 NSN: 9G 6150-01-488-4093	Y-Mouse USB to P/S 2 adapter		LCC 19
		Note 1	Cage: 61099 P/N: G81-1800-HAUS (LAUUS-0) NSN: 9G 4920-01-365-5661	Keyboard Data Entry		LCC 19
		Note 1	Cage: 61099 P/N: B-SAIMP Rev E NSN: 7GH5895-01-480-7203	Trackball Ruggedized		LCC 19

Remarks:

Note 1: All system support is provide by contacting the OED POC Maureen Myer at 619-553-3979 or myer@spawar.navy.mil

C. Are On-Board Support Items Required? (Yes or No): No
Responsible Activity, Name, Code, Telephone Number and E-mail Address: Maureen Myer, 619-553-3979, myer@spawar.navy.mil
1. Identify On-Board Support Items (i.e. SRIs, OBRPs and OSIs) in the table below:

SID # / SID ITEM #	AML Item #	APL / PAL / AEL Number	NSN or Cage / Part Number	Quantity (OBA)	Equipment Identification	MSD / PBL	Hull(s) Applicability

2. Is a Pack Up Kit or other type of support kit required? (Yes or No): **No**

D. Are Maintenance Assistance Modules (MAMs) Required? (Yes or No): No
1. If MAMs are not required, can you fault isolate down to the Lowest Repairable Unit (LRU)? (Yes or No): Yes
2. Identify MAMs in the table below:

SID # / SID ITEM #	AML Item #	APL / (PAL) / Number	NSN or Cage / Part Number	Quantity (OBA)	Stowage Location	Estimated Availability Date	Hull(s) Applicability

E. Are there any support requirements for Hazardous or Flammable Material? (Yes or No): No

SID # / SID ITEM #	AML Item #	Material Identification (NSN/Nomenclature)	Special Stowage / Handling Requirements

Remarks:

TECHNICAL MANUAL REQUIREMENTS

Responsible Activity, Name, Code, Telephone Number and E-mail Address: Maureen Myer, 619-553-3979, myer@spawar.navy.mil
1. Are there any Technical Manual Requirements? (Yes or No): **Yes - Technical Manuals provide on CD at time of install**

SID # / SID ITEM #	AML Item #	Technical Manual Identification Number (TMIN) / (IETM)	Title	Existing, Develop, Change or Revision	Estimated Completion Date	Hull(s) Applicability

2. If Final Technical Manuals are not available prior to installation, are red-lined or preliminary technical manuals available? (Yes or No):
(If yes, identify in the Remarks block those TMs, and whether they are red-lined or preliminary).

Remarks:

MAINTENANCE PLANNING REQUIREMENTS

Responsible Activity, Name, Code, Telephone Number and E-mail Address: Maureen Myer, 619-553-3979, myer@spawar.navy.mil
A. Are there any Planned Maintenance System (PMS) requirements? (Yes or No): No T/A For PROTOTYPE SYSTEM
1. If Validated MIPs / MRCs are not available prior to installation, are red-lined or preliminary PMS products available (e.g., MRC Facsimile, Technical Manual or Manufacturer's Operating Procedures Manual)? (Yes or No):
(If yes, identify in the Remarks block what type of PMS data is available, and whether they are red-lined or preliminary).

SID # / SID ITEM #	AML Item #	MIP / MRC	Identification Number	Existing, Develop, Change or Revision	Estimated Completion Date	Hull(s) Applicability

B. Is the Integrated/Class Maintenance Plan (ICMP/CMP) Impacted? (Yes or No): No

If yes, has the Maintenance Change Request been submitted via the 04 ICMP web page? (Yes or No):

NOTE: ICMP Maintenance change requests should be submitted via the NAVSEA 04 ICMP Web Page at http://www.webdb.nslc.fmso.navy.mil/icmp.nsf

SID # / SID ITEM #	AML Item #	ICMP Task Number	Existing, New or Revised	Estimated / Completion Date	Hull(s) Applicability

C. Are Technical Repair / Maintenance Standards Impacted? (Yes or No): No

SID # / SID ITEM #	AML Item #	TRS/MS Identification Number	Title	Existing, Develop, Change or Revision	Estimated / Completion Date

D. Are there Intermediate and/or Depot level maintenance requirements? (Yes or No): No

a. If yes, provide the date for the establishment these requirements. (DD MMM YYYY):

b. Provide name, code, telephone number and E-mail Address for Intermediate/Depot level maintenance requirements:

Remarks:

SUPPORT AND TEST EQUIPMENT REQUIREMENTS

Responsible Activity, Name, Code, Telephone Number and E-mail Address:
Maureen Myer, 619-553-3979, myer@spawar.navy.mil
A. Does the system use Built in Test / Built in Test Equipment for fault isolation? (Yes or No): No T/A For PROTOTYPE SYSTEM
B. Does the system have Support and Test Equipment Requirements? (Yes or No): No
C. Has SPETERL information been provided to NSWC IHD DETACHMENT EARLE? (Yes or No): No
If no, indicate when the SPETERL information will be provided in the Remarks block.
NOTE: If any GPETE or SPETE will not be available prior to installation, indicate what will be provided and when in the Remarks block.

SID # / SID ITEM #	AML Item #	Equipment Type	Nomenclature	APL/AEL	SCAT or NSN	Quantity	Estimated Availability Date	Hull(s) Applicability

Remarks:

TRAINING REQUIREMENTS

Responsible Activity, Name, Code, Telephone Number and E-mail Address:
Maureen Myer, 619-553-3979, myer@spawar.navy.mil
A. Does system have Training Requirements? (Yes or No): Yes
If Formal and / or Informal training courses are not available prior to first installation, indicate how training will be provided:
Onboard training upon completion of install.
Please provide a Navy Training Systems Plan (NTSP) Number:

B. Is Initial Training Required? (Yes or No): No

						Ship Sys. Manpower Req.				
SID # / SID ITEM #	AML Item #	Course Number and Title	Location	Trainers Impacted	Duration	NEC	Rating/ Rate	# Per Ship	ECD Date	Hull(s) Applicability

C. Is Follow-On Training required? (Yes or No): No

Please indicate how Follow-On Training Will be Identified. Briefly describe what plans have been made to update training hardware and software to support this change:

NOTE: Shore Trainer Installations should be completed approximately 4 months prior to first ship installation.

						Ship Sys. Manpower Req.					
SID # / SID ITEM #	AML Item #	Course Number and Title	Location	Trainers Impacted	Duration	NEC	Rating/ Rate	# Per Ship	ECD Date	RFT Date	Hull(s) Applicability

D. Are there any JQRs/PQS impacted by this change? (Yes or No): No

PQS:

NAVEDTRA Number	Title	Model Manager	Effective Date	Qualification Description

JQRs:

JQR Number	Title	Model Manager	Effective Date	Qualification Description

JQR Number	Title	Model Manager	Effective Date	Qualification Description

E. Identify any additional training products (such as Audio/Visual products, Computer Based Training CD-ROMS, Stimulation or Simulation products, etc.,) to be delivered in to the Fleet.

SID # / SID ITEM #	AML Item #	Product Number	Description	Format / Type	Estimated Availability Date	Hull(s) Applicability

Remarks:

PROPOSED INSTALLATION SCHEDULE

SHIP CLASS	HULL	INSTALL FY QTR	REMOVAL FY QTR (TEMPALTS)
LCC 19	LCC 19	FY03 Q2	FY04 Q2

Date ILS Certification Form prepared: 05 May 2003	**Revision Date:**
If revised, date and revision number of this ILS Certification form (DD MMM YYYY)/Rev #:	
ILS Certification Form for Alteration Number(s): TA0000K (LCC 19 - USS Blue Ridge) **Alteration Type:** TEMPALT	
Alteration Title and/or Brief: OSIS (Ocean Surveillance Information System) Evolutionary Development (OED)	
Purpose of this Alteration: Proof of concept for multilevel security (MLS) Afloat.	
Equipment Nomenclature(s) and AML #: No T/A For PROTOTYPE SYSTEM	
ILS Impact? (Yes or No): Yes	

	SHIP PROGRAM MANAGER(s) (SPM)	**Ship Class(es)**	**ILS Certification Caveat(s) Including Due Date(s)**
SUBMITTING ACTIVITY SIGNATURE	**SPM SIGNATURE**	LCC 19	
TYPED NAME Desiree Gomez	**TYPED NAME**		
ACTIVITY / CODE / PHONE NUMBER SPAWARSYSCOM / PMW 157F / 858-537-0259	**ACTIVITY / CODE / PHONE NUMBER**		
DATE	**DATE**		
SYSCOM APPROVAL (IF REQUIRED)	**SHIP PROGRAM MANAGER(s) (SPM)**	**Ship Class(es)**	**ILS Certification Caveat(s) Including Due Date(s)**
SUBMITTING ACTIVITY SIGNATURE	**SPM SIGNATURE**		
TYPED NAME Bob Tardif	**TYPED NAME**		
ACTIVITY / CODE / PHONE NUMBER SPAWARSYSCOM / 04L1A / 619-524-2529	**ACTIVITY / CODE / PHONE NUMBER**		
DATE	**DATE**		

APPENDIX F: TABLE OF NAVY REFERENCE MESSAGES

FLEET GENERATED REQUIREMENTS REFERENCES		
MSGID	**FROM**	**SUBJECT**
021132Z JAN 04	**COMENTSTRKGRU**	**OED MID-CRUISE REPORT**
PARA 2. CURRENT EMPLOYMENT. OED IS USED DAILY BY COMENTSTRKGRU AND COMDESRON EIGHTEEN STAFF AND ENTERPRISE INTELLIGENCE AND CRYPTOLOGIC PERSONNEL AS AN ALL-SOURCE INTELLIGENCE ANALYSIS TOOL AND AUTOMATED MESSAGE HANDLING SYSTEM. OED'S ABILITY TO RECEIVE, QUEUE, AND FORWARD RECORD MESSAGE TRAFFIC FROM UNCLASSIFIED THROUGH SCI COMPARTMENTS (HCS AND GG PARTICULARLY), HAS IMPROVED WATCHSTANDERS'AND LEADERSHIP'S ABILITY TO REVIEW TRAFFIC IN ONE PLACE WITHOUT HAVING TO ACCESS MULTIPLE SYSTEMS AND INDIVIDUAL QUEUES LEADING TO TIME SAVINGS AND INCREASED EFFICIENCY. OED'S MLS FUNCTIONALITIES FOR MESSAGE PROCESSING/HANDLING, LONG TERM TRACK DATA ANALYSIS, ACCESS TO SCI INTELINK AND PRE-LOADED NATIONAL DATABASES, AND SCI CHAT HAVE PROVEN TO BE BOTH INNOVATIVE AND HIGHLY EFFICIENT AS THEY PROVIDE A PREVIOUSLY UNAVAILABLE MEANS ABOARD A CV(N) TO WORK WITH BOTH GENSER AND SCI MATERIAL ON ONE WORKSTATION. PARA 5. ORIG RATES OED AS A QUALIFIED SUCCESS AND ENDORSES ITS CONTINUED INTEGRATION INTO ADDITIONAL CVICS.		
MSGID	**FROM**	**SUBJECT**
220115Z NOV 03	**COMSECONDFLT**	**SUBJ/OSIS EVOLUTIONARY DEVELOPMENT (OED) UPDATE (SERIAL 3): OED /FLEET INTELLIGENCE REQUIREMENTS**
PARA 1. THE OED INTELLIGENCE ARCHITECTURE PROVIDES AN MLS ENVIRONMENT WHOSE FOUNDATION OFFERS A REALIZABLE OPPORTUNITY FOR A CROSS DOMAIN SOLUTION (CDS) THAT SPANS THE COLLATERAL AND SCI ENVIRONMENTS. PARA 3. C2F OED UTILIZATION. OED ENABLES INTELLIGENCE PRODUCTION AT THE SCI LEVEL, AND AUTOMATIC, RAPID, RELIABLE DISSEMINATION INTO THE COLLATERAL ENVIRONMENT OF THE WARFIGHTER. A. C2F/CSFL CURRENTLY USES OED TO SUPPORT DAILY JIC WATCH INTELLIGENCE REQUIREMENTS. C2F/CSFL J2 HAS AN OED SERVER AND FIVE WORKSTATIONS (THREE IN JIC SPACES, ONE IN J2 OFFICE, AND ONE IN J2 STAFF SPACES). OED IS CURRENTLY ACCREDITED AND HAS FULL NETWORK ACCESS TO JWICS AND SCI MSG TRAFFIC, AND CAN TRANSMIT TO COLLATERAL (U.S. AND NATO) RECORD MESSAGE SYSTEMS. C2F/CSFL OED CURRENTLY PROCESSES MESSAGES TO THE FLEET SIPRNET ENVIRONMENT VIA A GCCS-M SERIAL CONNECTION, ALLOWING AUTOMATIC DISSEMINATION OF OPERATIONAL TRAFFIC. LIKEWISE, OED PROCESSES NATO MSG TRAFFIC (SEND/RECEIVE) INTO THE COLLATERAL ALLIED INFORMATION MESSAGE SYSTEM (AIFS/AIMS). OED PASSES INFORMATION VIA A LIVE MLS FILTER FEED WHICH IS AUTOMATICALLY AND SEEMLESSLY DOWNGRADED TO SECRET AND NATO SECRET LEVELS IN NON-SCIF SPACES. OVER 100 HIGH INTEREST MERCHANT MESSAGES HAVE BEEN PROCESSED TO THE COLLATERAL WORLD WITHOUT ERROR IN A TRUE MLS FASHION. THE BENEFIT IS THAT THREAT SHIP UPDATES ARE AUTOMATICALLY PASSED IN A TIMELY MANNER TO OPERATION NOBLE EAGLE SUPPORT SHIPS AND SQUADRONS VIA RELIABLE AND ACCURATE MULTIPLE SECURITY LEVEL METHODOLOGY. B. ADDITIONAL FUNCTIONS SUPPORTING JIC WATCH REQUIREMENTS INCLUDE: -WATCHSTANDERS SEARCH ARCHIVED MESSAGES FOR THEMATIC ISSUES AND KEYWORDS. THESE SEARCHES OCCUR ACROSS MULTIPLE SECURITY LEVELS, SAVING WATCHSTANDER TIME AND ALLOWING MORE TIME FOR ANALYSIS. -OED ALLOWS WATCHSTANDERS TO TRACK VESSEL MOVEMENT THROUGH TIME, SUPPORTING WATCH SITUATIONAL AWARENESS REQUIREMENTS. -MESSAGE TRAFFIC IS AUTO FORWARD TO WATCHSTANDER JWICS ACCOUNTS BASED ON OED		

FLEET GENERATED REQUIREMENTS REFERENCES

USER-DEFINED PROFILES.
C. C2F/CSFL NEAR TERM OBJECTIVES. HOW WE WILL BETTER USE THE FUNCTIONALITIES ALREADY EXISTING IN OED.
(1). EXPAND USE OF OED TO IMPROVE HLS/HLD ANALYSIS AND OPERATIONAL SUPPORT.
-DISSEMINATE EVENT-BY-EVENT HIGH INTEREST MERCHANT SUPPORT TAILORED TO C2F RESPONSIBILITIES FOR INTEGRATION INTO THE COP.
-DISSEMINATE DAILY AT/FP SUPPORT MESSAGE TO U.S. AND NATO AUDIENCE TAILORED TO C2F/CSFL RESPONSIBILITIES.
(2). EXPAND OED USE TO SUPPORT J2 USERS AT ANY JWICS SCI WORKSTATION.
-AUTO-DISTRIBUTE ALL-SECURITY LEVEL MSG TRAFFIC AND SCI E-MAIL BASED ON USER DEFINED DISSEMINATION PROFILES.
(3). EXPAND C2F/CSFL ORGANIC SYSADMIN SKILLS AND CAPABILITIES TO LOOSEN LIFE-LINE ON CONTRACTOR SUPPORT.
-CREATE SCRIPTS TO HANDLE BASIC DAY TO DAY SYSADMIN
-DEVELOP EXPERTISE RECOGNIZED AS THE FLEET STANDARD THAT ENABLES ACCESS TO PRIVILEGES NECESSARY FOR COMPREHENSIVE IN-HOUSE SYSTEM MANAGEMENT.

MSGID	FROM	SUBJECT
151130Z SEP 03	**USS BLUE RIDGE**	**SUBJ/JOINT MESSAGE HANDLING SYSTEM (JMHS) REPLACEMENT**

PARA 3. AN EXAMPLE OF A MORE POWERFUL MESSAGE HANDLING SYSTEM IS THE OSIS EVOLUTIONARY DEVELOPMENT (OED) SYSTEM THAT WAS RECENTLY INSTALLED IN SUPPORT OF SCI/GENSER INTELLIGENCE MESSAGE HANDLING. THE COMMAND SHIP STRONGLY DESIRES THE FLEXIBILITY, SPEED AND EFFICIENCY NOTED IN THE OED MESSAGE HANDLER

PARA 4. USS BLUE RIDGE STANDS READY TO WORK WITH SPAWAR TO IDENTIFY, TEST AND INSTALL THE NEXT GENERATION OF MESSAGE HANDLER

MSGID	FROM	SUBJECT
180901Z SEP 03	**JAC MOLESWORTH**	**OED PROGRAM SUPPORT**

PARA 1. REQUESTS CONTINUATION OF OED RDT&E, OMN, OPN SUPPORT DUE TO THE CRITICALITY OF OED TO THE JAC'S MISSION.

MSGID	FROM	SUBJECT
211846Z AUG 03	**COMLANTFLT / N2/N3**	**OED SUPPORT TO THE FLEET**

CLASSIFIED – "PARA 3 (U)….COMLANTFLT REQUIRES CONTINUED CONTACT REPORTING AND REQUESTS JFIC CONTINUE TO HOST [OED] AND OPNAV N612, ONI-4 AND PMW-157 CONTINUE TO REOURCE THIS CRITICAL SUPPORT TO THE FLEET."

MSGID	FROM	SUBJECT
030845Z JUL 03	**C7F**	**FLEET BATTLE EXPERIMENT KILO QUICKLOOK**

PARA 6. INITIATIVE AREA THREE: JOINT FIRES….A RAPIDLY RECONFIGURABLE AND RELIABLE TECHNOLOGY THAT CAN QUICKLY MEET SECURITY APPROVALS MUST BE IN PLACE SO THAT COALITION PARTNERS CAN ARRIVE IN AN AOR AND QUICKLY BECOME PARTICIPANTS IN AN EXISTING FIRES NETWORK.

MSGID	FROM	SUBJECT
281346ZMAR03	**CFFC N6 / N2**	**FLEET REQUIREMENTS FOR A MULTI LEVEL SECURE (MLS) SOLUTION**

PARA 3. ISSUE: IN TODAY'S ENVIRONMENT OF TIME SENSITIVE AND COALITION OPERATIONS, A MLS SYSTEM IS INCREASINGLY IMPORTANT TO IMPROVE COMMUNICATION EFFICIENCY AND INCREASE SPEED OF INTELLIGENCE EXCHANGE AMONG ALLIES AND COALITION

FLEET GENERATED REQUIREMENTS REFERENCES

PARTNERS. DESPITE EFFORTS BY ALCON, TO DATE THERE REMAINS NO SINGLE IDENTIFIED SOLUTION THAT PROVIDES THE FLEET AN ACCREDITED MLS NETWORK THAT BRINGS TOGETHER THE COMPLEX ARRAY OF GENSER AND SCI STOVEPIPES (COWAN A, CENTRIXS TIER 1, NIDTS, CLOCE, STONEGHOST, BISON, ETC.) USED BY THE FLEET TODAY.

PARA 4. REQUIREMENT: A SINGLE NETWORK EQUIPPED WITH COMMON APPLICATIONS THAT HANDLES AND AGGREGATES DATA OF VARIOUS SECURITY LEVELS ACROSS BOTH SCI AND COLLATERAL DOMAINS WITHIN AN ACCREDITED MLS ARCHITECTURE / OPERATING SYSTEM.

MSGID	FROM	SUBJECT
281159Z MAR 03	**C2F/C3F**	**NUMBERED FLEET TOP TEN INFORMATION TECHNOLOGY REQUIREMENTS**

PARA 5. MULTIPLE LEVEL SECURITY (MLS). MULTIPLE LEVEL SECURITY SHOULD PROVIDE THE FULL RANGE OF COLLABORATION CAPABILITIES ACROSS NUMEROUS NETWORKS OF DIFFERENT SECURITY CLASSIFICATION LEVELS, TO INCLUDE SEAMLESS EXCHANGE OF EMAIL, WEB PRODUCTS, FILE SHARING AND CHAT.

MSGID	FROM	SUBJECT
111450Z MAR 03	**COMSECONDFLT**	**SCI NETWORK SUPPORT REQUIREMENTS**

PARA 3. REQUIREMENT. THE NUMBERED FLEET SCI INFRASTRUCTURE IS THE BACKBONE FOR INTELLIGENCE EXCHANGE BETWEEN THE NATIONAL COMMUNITY, THE WATERFRONT, AND DEPLOYED UNITS. EFFECTIVE SUPPORT TO TACTICAL FORCES FROM THE OPERATIONAL LEVEL OF COMMAND IS SEVERELY DEGRADED WITHOUT A ROBUST AND OPERATIONALLY RELIABLE SCI INFRASTRUCTURE. EXPANDING MISSIONS (TO INCLUDE HLS/HLD FOR C2F AND C3F) AND TAILORED MULTI-LEVEL SECURITY SUPPORT TO TACTICAL UNITS, AS WELL AS EXPANDED INTEGRATION WITH JOINT OPS THROUGH THE FUNCTIONALLY INTENSE JOINT FORCE MARITIME COMPONENT COMMANDER (JFMCC) REQUIRE:
A. HARDWARE AND SOFTWARE MAINTENANCE TO INCLUDE REFRESH.
B. OPERATIONAL AND MAINTENANCE TRAINING.
C. TECHNOLOGY GROWTH APACE OF EVOLVING ANALYTICAL AND MULTI-LEVEL SECURITY NEEDS.
D. ABILITY TO TRANSITION SEAMLESSLY BETWEEN AFLOAT AND ASHORE OPERATIONS.

MSGID	FROM	SUBJECT
262206Z FEB 03	**COMENTBATGRU**	**REQUEST FOR OED INSTALLATION**

SUMMARY: REQUEST TO C2F FOR SUPPORT OF OED INSTALLATION ONBOARD USS ENTERPRISE (CVN 65)

MSGID	FROM	SUBJECT
211942Z FEB 03	**COMSECONDFLT (COORDINATED COMSECONDFLT / COMTHIRDFLT MESSAGE)**	**SEA POWER-21 IMPLEMENTATION MESSAGE NR-3; OPERATIONAL AGENT REQUIRED WARFIGHTING CAPABILITIES LIST (U)**

“C2F AND C3F IN PARTNERSHIP WITH THE OTHER NUMBERED FLEETS, DEVELOPED AN INITIAL LIST OF REQUIRED WARFIGHTING CAPABILITIES WHICH WAS PRESENTED AT THE FIRST MEETING OF THE SEA TRIAL EXECUTIVE STEERING GROUP (STESG) ON 13 FEB 03. “

“PARA 6. SEA BASING IMPROVE AND/OR DEVELOP
A. JOINT FORCE MARITIME COMPONENT COMMANDER (JFMCC) CONCEPT
B. COLLABORATIVE INFORMATION ENVIRONMENT
C. MULTI-NATIONAL COMMAND AND CONTROL INTELLIGENCE INFORMATION MANAGEMENT, ANALYSIS, AND FUSION SUPPORT TOOLS MULTI-LEVEL SECURITY STANDARDIZED COALITION IT CONNECTIVITY”

FLEET GENERATED REQUIREMENTS REFERENCES

MSGID	FROM	SUBJECT
101447ZDEC02	**COMSECONDFLT**	**OSIS EVOLUTIONARY DEVELOPMENT (OED) AFLOAT: EVALUATION**

PARA 3. EVALUATION.
SUMMARY: OVERALL, OED IS A FLEXIBLE, RELIABLE ANALYTICAL SUPPORT SYSTEM FOR USE AT SEA. OED'S ANALYSIS TOOLS WERE ENABLERS FOR THE FUSION PROCESS IN A SINGLE WORKSTATION. DESIGNED FROM THE START TO SUPPORT MULTI-LEVEL-SECURITY INTELLIGENCE ANALYSIS, OED'S EXISTING ACCREDITATION PROVIDES A SOLID FOUNDATION FOR RAPID MODIFICATION TO ENABLE INTELLIGENCE SUPPORT TO COALITION OPERATING ENVIRONMENTS. THE OED SYSTEM HAS UNTAPPED POTENTIAL TO BE THE CORE OF INTEGRATION EFFORTS FOR NAVY INTELLIGENCE CENTERS AFLOAT.

PARA 5. A FLOAT VISION FOR OED.
A. ABILITY TO OPERATE IN THE MULTI-NATIONAL ENVIRONMENT IN THE AFLOAT JIC AS WELL AS WITH EXTERNAL PARTNERS.
B. ABILITY TO RECEIVE AND MANIPULATE IMAGERY.
C. ABILITY TO OVERLAY AND DISPLAY SIMILAR EVENTS REPORTED BY MULTIPLE INTELLIGENCE DISCIPLINES (E.G., IMAGERY, MASINT, ELINT, COMINT) IN THE SAME GEO-REFERENCE FRAME.
D. MLS DATABASE TO HAVE HTML DATA-CONTENTS TAGS AS WELL AS SECURITY LABELS.
E. ABILITY TO HAVE DIRECT DATA AND VOICE (VOICE OVER IP) INTEROPERABILITY WITH OTHER OED SITES (INCLUDING NON-U.S.).
F. ABILITY TO INTERFACE WITH COALITION INTELLIGENCE DATABASES SUCH AS NATO BATTLEFIELD INFORMATION COLLECTION AND EXPLOITATION SYSTEM (BICES). AS INFORMATION IS PULLED FROM THESE DATABASES, OED APPLICATIONS WOULD ALLOW THE INFORMATION TO BE GRAPHICALLY DISPLAYED AND FUSED INTO A COMMON OPERATING PICTURE. OED WOULD PRESERVE THE ORIGINAL NATO RELEASABILITY OF THIS INFORMATION AS IT IS FUSED IN AN ALL-SOURCE INTELLIGENCE ENVIRONMENT.

MSGID	FROM	SUBJECT
132202ZAUG02	**COMTHIRDFLT**	**JCSBG INTELLIGENCE LESSONS LEARNED**

PARA 1.B: "STRONGLY ENDORSE THE CONTINUALLY IDENTIFIED FLEET REQUIREMENT FOR A MULTI-LEVEL SECURITY SYSTEM AFLOAT." "WRT OED, INFORMAL LIAISON MENTIONED IN REF A SHOULD MOVE TO A FORMAL LOOK, IN THEATER AT JICPAC, AND AFLOAT ABOARD MOUNT WHITNEY., TO DETERMINE FUNCTIONALITIES THAT CAN BE REALIZED AFLOAT ON PACFLT SHIPS TODAY."

MSGID	FROM	SUBJECT
021820ZAUG02	**COMCARGRU 7**	**EQUIPMENT - LACK OF A MULTI-LEVEL SECURITY SYSTEM AFLOAT IDCLS/L/12373-20899/U// ORIG/CCG7/LCDR GREG HUSMANN**

OBSERVATION:
OEF OPERATIONS WERE CONDUCTED AS PART OF AN INTERNATIONAL COALITION. AS THE SENIOR INTELLIGENCE ENTITY AFLOAT, THE JCSBATGRU N2 STAFF WAS CHARGED WITH COORDINATING THE TIMELY EXCHANGE OF INTELLIGENCE BETWEEN MANY COALITION MEMBERS. SUCH EXCHANGES WERE ACCOMPLISHED VIA A COMPLEX ARRAY OF COMPUTER SYSTEMS OPERATING AT SEVEN DIFFERENT CLASSIFICATION LEVELS (JWICS, SIPRNET, NIPRNET, STONE GHOST, BISON, COWAN, AND LOCE). WHILE SUCH CONFIGURATIONS ARE WORKABLE OVER THE SHORT TERM, THEY PRESENT MANY CHALLENGES THAT IMPEDE THE TIMELY FLOW OF INTELLIGENCE WITHIN A COALITION ARCHITECTURE. THE REQUIREMENT EXISTS FOR A SINGLE WORK STATION EQUIPPED WITH COMMON INTELLIGENCE APPLICATIONS ACROSS THE FULL SPECTRUM OF POTENTIAL SECURITY CLASSIFICATION LEVELS.

FLEET GENERATED REQUIREMENTS REFERENCES

DISCUSSION:
A MULTI-LEVEL SECURITY SYSTEM SHOULD BE CAPABLE OF PROCESSING AND EXCHANGING DATA AT THE DESIRED CLASSIFICATION LEVEL USING THE FOLLOWING APPLICATIONS: ALL MICROSOFT OFFICE APPLICATIONS, MICROSOFT CHAT, WEB BROWSE, AND EMAIL. ADDITIONALLY, THE SYSTEM SHOULD ALSO HAVE THE ABILITY TO AUTOMATICALLY DISSEMINATE MARITIME TRACK DATA TO COALITION PARTNERS AT THE APPROPRIATE CLASSIFICATION LEVEL. CURRENTLY SUCH FEATURES ARE NOT AVAILABLE TO IT-21 OR GCCS-M WORKSTATIONS.

RECOMMENDATION:
OVER THE LONG TERM INCORPORATE MULTI- LEVEL SECURITY FUNCTIONALITY INTO GCCS-M. FOR THE SHORT TERM, RECOMMEND INSTALLATION/INTEGRATION OF WORK STATIONS WITH THE MLS CAPABILITIES INHERENT IN OED IN BOTH CVIC AND SUPPLOT TO MEET REQUIREMENTS FOR MLS AFLOAT.

MSGID	FROM	SUBJECT
180235Z DEC 01	**COMSECONDFLT**	**SCI GCCS-M LAN UPGRADE REQUIREMENTS**

"TO ACHIEVE NECESSARY FUNCTIONALITY COMMENSURATE WITH INTELLIGENCE AND ISR MANAGEMENT AT THE JTF LEVEL, A COMPREHENSIVE SCI GCCS-M LAN UPGRADE IS REQUIRED TO PROVIDE AN ACCURATE, TIMELY , FUSED ALL-SOURCE, MULTI-SECURITY LEVEL INTELLIGENCE PICTURE TO SUPPORT C2F / COMSTRIKFLTLANT MISSIONS. THE FOLLOWING FUNCTIONALITES ARE REQUIRED:
A. AUTOMATED MESSAGE HANDLING / MULTI-SECURITY LEVEL INFORMATION MANAGEMENT
(1) SINGLE, AGGREGATED, MULTI-SECURITY LEVEL DATABASE SUPPORT, ACCESS TO MULTI-SECURITY LEVEL FILE SHARING OF SCI, US ONLY, NATO AND UNCLASSIFIED RECORD MESSAGE TRAFFIC, EMAIL AND MS OFFICE PRODUCTS
(3) MULTI-SECURITY LEVEL WEB SERVICES
B. ALL-SECURITY-LEVEL LAND/AIR /MARITIME (MERCHANT/SURFACE/ SUBSURFACE) TRACK MANAGER WITH HISTORY AND TREND ANALYSIS CAPABILITY.
E. A SECURITY LAN INTERFACE BETWEEN U.S. AND NATO/COMMMONWEALTH SYSTEMS, TO INCLUDE: LINKED OPS CENTERS EUROPE (LOCE), COMBINED OPERATIONAL INTEL SYSTEMS (COINS), NATO INITIAL DATA TRANSFER SYSTEMS (NIDTS), MARITIME COMMAND CONTROL INFORMATION SYSTEMS (MCCIS), JOINT OPERATION INTELLIGENCE INFORMATION SYSTEM (JOIIS), INITIAL CAOC CAPABILITY (ICC), AND INTELINK-C/STONEGHOST.

MSGID	FROM	SUBJECT
211442ZMAY 01	**CINCLANTFLT N6A**	**CINCLANTFLT MULTI SECURITY LEVEL-MULTI LEVEL SECURITY (MSL-MLS) FOCUS WORKSHOP RESULTS**

PARA 2. BASED ON CONFERENCE RESULTS, MSL-MLS SYSTEMS MUST PROVIDE:
A. REDUCED HULL, MECHANICAL AND ELECTRICAL (HM&E) SHIPBOARD FOOTPRINT: CURRENTLY THERE ARE MULTIPLE AFLOAT NETWORKS. IT IS NOT UNCOMMON TO HAVE A SINGLE AFLOAT OPERATOR WHO MUST USE TWO OR THREE COMPUTERS TO ACCOMPLISH THEIR MISSION. THE MAIN THREE OPERATIONAL NETWORKS ON LANTFLT VESSELS ARE SIPR, NIPR, AND NATO/COALITION. ON MANY PLATFORMS, THE HM&E/HEATING, VENTILATION, AIR CONDITIONING (HVAC) EQUIPMENT TO SUPPORT TWO OR THREE SEPARATE NETWORKS AND ASSOCIATED DESKTOP COMPUTERS HAS OFTEN EXCEEDED THE SHIP'S ABILITY TO SUPPORT THEM WITH ADEQUATE POWER AND COOLING.
B. ABILITY TO SECURELY EXCHANGE DATA BETWEEN USERS/SYSTEMS THAT PROCESS DATA ON DIFFERENT CLASSIFICATION LEVELS: IN ADDITION, THE PATH MUST BE CAPABLE OF NOT HAVING DATA "LEAK" FROM HIGH SIDE TO LOW SIDE.
C. ABILITY FOR MSL-MLS TO OPERATE IN BANDWIDTH CONSTRAINED ENVIRONMENTS: THERE ARE TACTICAL UNITS WHO RELY ON DATA PIPES OF 28KB OR LESS TO ACCOMPLISH THEIR

FLEET GENERATED REQUIREMENTS REFERENCES		
MISSION. MSL-MLS SOLUTIONS MUST BE DESIGNED TO OPERATE AT THE LOWEST COMMON DENOMINATOR. D. ABILITY FOR MSL-MLS TO OPERATE IN DEGRADED ENVIRONMENT:WITH INCREASING RELIANCE BY OUR OPERATING FORCES TO CONDUCT THEIR MISSIONS VIA SIPR AND NIPR, MSL-MLS SOLUTIONS MUST BE BUILT ROBUST ENOUGH TO "FIGHT HURT".		
MSGID	**FROM**	**SUBJECT**
272118ZFEB01	**COMSECONDFLT**	**FLEET REQUIREMENTS FOR MULTI LEVEL NETWORKS**
PARA 4.B. ACCELERATED DEVELOPMENT AND FIELDING OF FULL CONTENT-BASED MLS SOLUTIONS.		

Table 7. Reference Naval Messages Defining CDS Requirements (From Various)

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California

3. Professor Wally Owen
   Naval Postgraduate School
   Monterey, California

4. LCDR Pat Mack
   SPAWAR Detachment Yokosuka
   Yokosuka, JAPAN

5. Christopher J. Newcomb
   SPAWAR
   San Diego, CA

6. John J. Falbo, II
   SPAWARSYSCEN-San Diego
   San Diego, CA